

RoughDeck[®] BDP

Barrel Scale


Installation/Operation Manual



RICE LAKE[®]
WEIGHING SYSTEMS
To be the best by every measure[®]

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About This Manual

This manual is intended for use by technicians responsible for installing and servicing the RoughDeck® BDP.



Authorized distributors and their employees can view or download this manual from the Rice Lake Weighing Systems distributor site at www.ricelake.com.

1.0 Introduction and System Overview

The RoughDeck BDP is a fully electronic, low profile, NTEP-certified load receiving barrel scale that provides exceptional performance and serves as an economical solution in general weighing applications.

The RoughDeck BDP comes in two standard platform sizes: 30 in x 31 in (.76 m x .79 m) and 36 in x 37 in (.91 m x .94 m), and in capacities from 1K- to 2.5K-lbs (500–1250 kg). NTEP-certified, alloy steel shear beam load cells or stainless steel load cells are available with the cells recessed into the frame channels for protection. Also included is a signal-trim summing board enclosed in an aluminum or durable stainless steel enclosure that has a convenient top-access for any necessary corner corrections.

Load cell cables are run through the main channels and held down with replaceable cable ties near each corner, eliminating the possibility of cable damage in portable applications. Threaded holes, located in the top corners of the deck, are another useful feature. This allows for placement of removable eyebolts to lift the scale from above with chains and safely place the scale in a portability frame for 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.

The adjustable feet are used to allow leveling the scale to make up for minor floor irregularities. The threaded lifting holes double as foot adjustment holes adding to the ease of installation. Optional floor anchor plates are available to secure the scale to the floor if access ramps or a portability frame aren't used. If floor ramps are used, then the ramps hold the scale in place.

Other available options include portability frames and access ramps for both sizes of the RoughDeck BDP.



Figure 1-1. RoughDeck BDP Barrel Scale (shown with optional portability kit and IQ plus® 390-DC indicator)

1.1 Model Designations

An identification tag is located on the frame next to the junction box tray. When ordering replacement parts, be sure to include both the model and serial number of the scale.

Mild Steel

Mild steel versions come equipped with the following:

- Treaded top plate
- Aluminum NEMA 4 junction box
- Alloy steel load cells

Stainless Steel

Stainless steel versions come equipped with the following:

- Smooth top plate
- Stainless steel NEMA 4X junction box
- Stainless steel or stainless steel with welded seal (IP67) load cells

1.2 Operating Requirements

Electrical Grounding

For permanent installations 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 3W 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

200% for 1K models

80% for 2.5K models

Scale to Indicator Cable Length

10 ft (3 m)

Approvals



NTEP CoC 03-060

2.0 Installation

The RoughDeck BDP can be installed either permanently or used as a portable scale depending on the intended location. There are certain requirements for installation based on the desired location of the RoughDeck BDP. The following sections describe the correct installation procedures for installing the RoughDeck BDP as a permanent scale or a portable scale.

Both types of installations require some basic steps that are characteristic to both types:

1. Selecting a site
2. Checking levelness and smoothness of site
3. Unpacking the scale

2.1 Site Preparation

The scale must not be loaded beyond its capacity, even momentarily. Avoid areas where the scale might receive damaging side impacts from wheels or forklift tines, or shock damage from falling objects. 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, is necessary if using the scale in a permanent location.

In operation, the scale must be level within 1/4 inch. Either choose a site where the floor is close to this standard to avoid excessive shimming, or modify the floor at the chosen site to meet this standard. Use the bubble level in the center of the scale deck to determine if the scale is level.

2.2 Unpacking

Remove all packing material and visually inspect the floor scale for visible damage caused during shipment. If any parts were damaged in shipment, notify Rice Lake Weighing Systems and the shipper immediately.

Scale Only

The shipping container for the scale should contain the following:

- Floor scale
- Floor scale feet
- Installation manual
- Ten foot length of load cell cable

Portability Frame

The shipping container for the portability frame should contain the following:

- Scale frame
- Indicator stand
- Mounting hardware



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.

All RoughDeck BDP models have four threaded eyebolt holes located in the corners of the deck to allow installation of eyebolt hooks for use when lifting the scale with chains.

It's recommended to use 1/2 in-13NC eyebolts in 1K–2.5K-lb capacity scales.

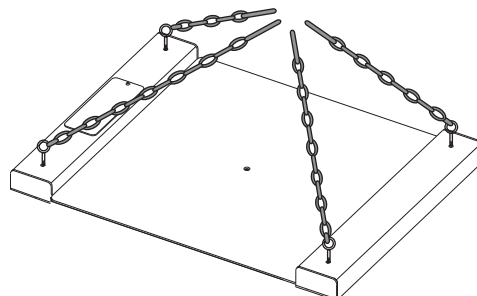


Figure 2-1. Proper Lifting Technique

3.0 Permanent Installation

The following steps are needed to install the RoughDeck BDP in a permanent location.

1. Adjust the four feet on the scale
2. Install mounting plates to the floor (if not using access ramps)
3. Connect cable to the indicator
4. Calibrate the unit

Access ramps are described in Section 3.2.

3.1 Assembly

The following paragraphs give instructions for installing and adjusting the scale feet and anchor plate.

3.1.1 Installing and Adjusting Feet

For load cell protection during shipping, the scale feet are not installed in the floor scale.

Screw one foot into each load cell and turn all the way in until the top of the foot touches the load cell or the foot stem touches the underside of the deck. Then unscrew each foot ten 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 or use the bubble level located in the center of the deck.

3.1.2 Anchor Plate Installation

For permanent applications with no access ramps the scale should be secured to the floor to prevent sideways movement. Two mild steel, floor anchor plates with holes that slightly exceed the foot diameter are available as an option for that purpose. Use the following steps to install floor anchor plates:

1. Lift the scale so that the feet are approximately one inch off the floor.
2. Slide mounting plates under two diagonally opposed feet.
3. Lower the scale back to the floor, and position the plates as shown in Figure 3-1 so that the bolt-down holes are accessible from above.
4. Using the mounting plates as templates, drill pilot holes into the floor for suitable anchor bolts. Bolt the plates to the floor using 1/2 inch anchor bolts.
5. Recheck foot adjustment and deck level after this operation.

NOTE: For installations using access ramps, mounting plates are not necessary as the ramps have built-in mounting plates to secure the scale feet.

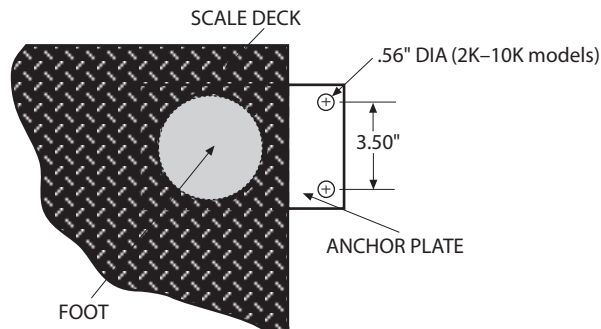


Figure 3-1. Anchor Plate Installation

3.2 Access Ramps

Optional access ramps for the RoughDeck BDP barrel scale come in both mild steel and stainless steel versions and have a standard treaded plate. They 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 and that are perpendicular to the side rails. For example, the scale shown below 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.

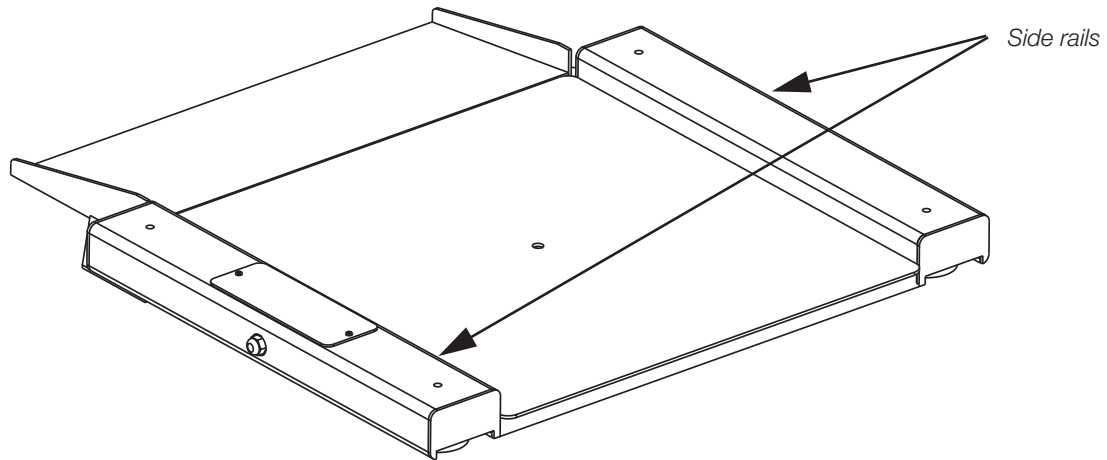


Figure 3-2. Optional Access Ramp

3.3 Electrical Interface to Indicator

Ten feet of 6-wire cable to connect the scale to the weight indicator is supplied with each scale. The junction box is easily accessible through a top access plate located on the top of the RoughDeck BDP. Use the following steps to wire up the junction box:

1. Remove the two screws using an 1/8 inch allen wrench to remove the scale junction box cover plate.
2. Slide the junction box assembly out of the deck.
3. Open and remove the top of junction box.
4. Push the cable end into the junction box through a cord grip.
5. Connect the wires to the indicator terminal (Figure 3-3) as shown in Table 3-1.
6. Pull out excess cable and tighten the cord grip to hold the cable snugly.

Cable Color Code	Junction Box
Red	+ Excitation
Black	- Excitation
Green	+ Signal
White	- Signal
Bare	Shield
Yellow	+ Sense
Blue	- Sense

Table 3-1. Junction Box Connections

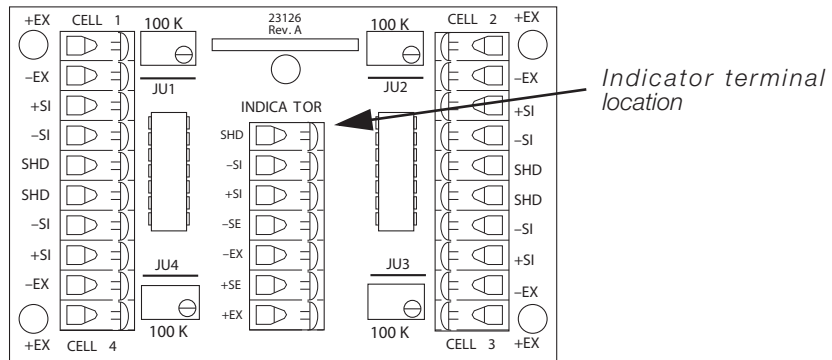


Figure 3-3. Junction Box Wiring Diagram

For permanent installations it's desirable to have the cable routed to the indicator in a manner that will protect the cable from damage. This method of cable protection in non-washdown applications is shown in Figure 3-4.

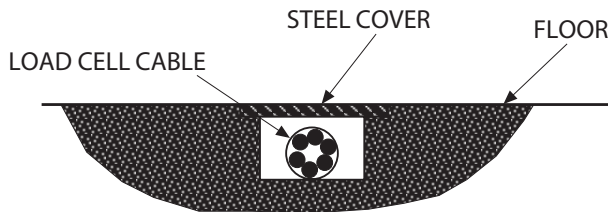


Figure 3-4. Load Cell Protection

7. When the interface cable is protected and in its final position, complete connections to the indicator. See the indicator installation manual for wiring information.
8. If necessary, trim corners as described in Section 5.2 on page 9.
9. Check all strain relief fittings for tightness.
10. Put the cover back onto the junction box assembly and place the junction box back in the scale.
11. Secure the scale junction box cover plate.



Figure 3-5. Junction Box Diagram

4.0 Portable Deck Installation

The RoughDeck BDP offers an optional portability frame kit, which makes the RoughDeck BDP easy to move from place to place and can easily convert a permanent scale into a portable one. The portability frame is compact and sits below the live siderails so it will not interfere with weighing pallets or larger items. The frame contains casters, indicator stand, and mounting hardware. Due to the wheel engager design, the wheels will not interfere with larger items.



WARNING Do not use casters to transport a load. When lifting or lowering the casters, assist by lifting the end of the scale with one hand while operating the toggle with the other.

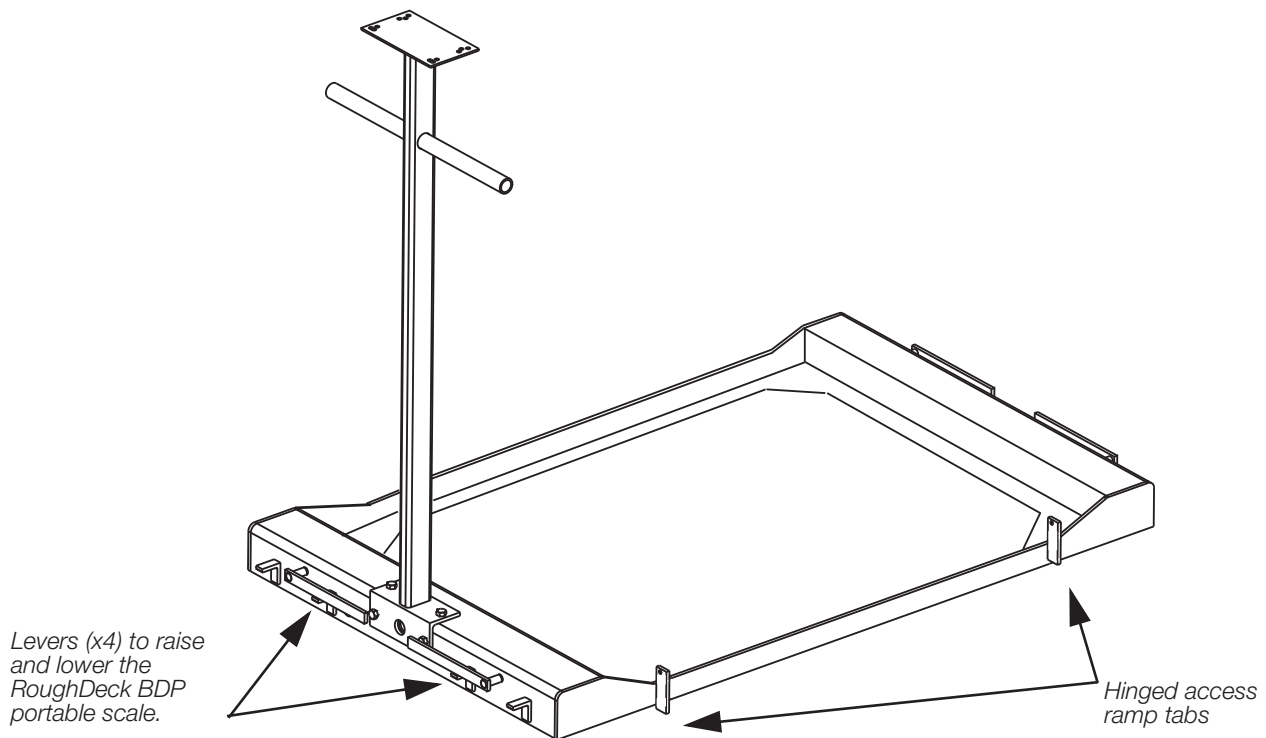


Figure 4-1. Portability Frame Kit Diagram

The RoughDeck BDP scale fits inside of the portability frame. Refer to Figure 2-1 on page 3 for the proper lifting technique when setting the scale into the portability frame or removing it out of the frame. Four levers located on the sides of the portability frame are used for raising or lowering the portability frame for movement.

To lower the frame into a stationary position, engage the levers on the sides of the portability frame and lower them down. This lever action will drop the entire frame down onto the floor making the frame and scale stationary.

To raise the scale so that it can be moved, engage the levers on the sides of the portability frame and raise them up. This will raise the entire frame and then the scale can be easily moved from one location to the next.

4.1 Hinged Access Ramps

Optional hinged access ramps are available with the portability frame. The RoughDeck BDP's low profile design allows the ramps to sit flush with the ground eliminating a speed bump, yet hinged so the operator can rest them on the scale's surface when moving the scale. Ramps come in either mild steel or stainless steel. The hinged access ramps attach to the portability frame by attaching them to the access ramp tabs (as shown in Figure 4-1), with 1/4-20 bolts and nuts.

4.2 Electrical Interface to Indicator

Ten feet of 6-wire cable to connect the scale to the weight indicator is supplied with each scale. The junction box is easily accessible through a top access plate located on the top of the RoughDeck BDP. Use the following steps to wire up the junction box.

1. Remove the two screws using an 1/8 inch allen wrench to remove the scale junction box cover plate.
2. Slide the junction box assembly out of the deck.
3. Open and remove the top of junction box.
4. Push the cable end into the junction box through a cord grip.
5. Connect the wires to the indicator terminal (Figure 4-2) as shown in Table 4-1.
6. Pull out excess cable and tighten the cord grip to hold the cable snugly.

Cable Color Code	Junction Box
Red	+ Excitation
Black	- Excitation
Green	+ Signal
White	- Signal
Bare	Shield
Yellow	+ Sense
Blue	- Sense

Table 4-1. Junction Box Connections

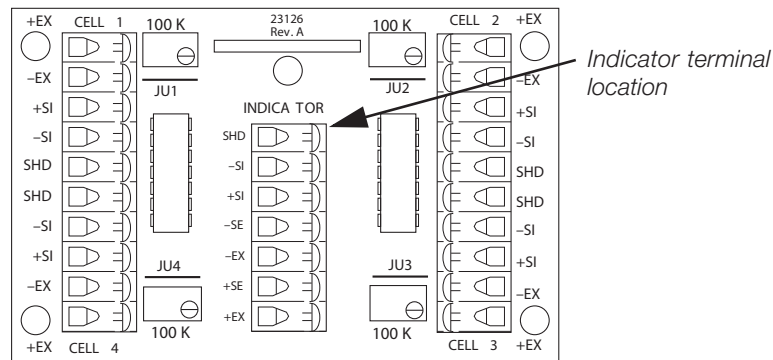


Figure 4-2. Junction Box Wiring Diagram

7. See the indicator installation manual for wiring information.
8. If necessary, trim corners as described in Section 5.2.
9. Check all strain relief fittings for tightness.
10. Put the cover back onto the junction box assembly and place the junction box back in to the scale.
11. Secure the scale junction box cover plate.

5.0 Adjustments and Calibration

The following sections describe adjustments that need to be made to the RoughDeck BDP barrel scale.

5.1 Mechanical Adjustments

To accommodate minor floor unevenness, the scale feet can be used to adjust scale height up or down a fraction of an inch. Adjust the feet by hand or with a screw driver 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^{®1} tape or Loctite^{®2}.

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 can be damaged by bending or stripping threads if extended beyond the maximum height adjustment.

When height adjustments are complete, recheck the bubble level located in the center of the deck. The scale deck must be level within 1/4 inch.

5.2 Corner Correction

All assembled RoughDeck BPD scales are corner-trimmed at the factory as part of the final assembly process. 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 in the junction box—a process known as trimming.

Remove the junction box cover and identify the correct load cell terminal corresponding to each corner (labeled CELL 1, CELL 2, and so on). See Figure 6-4 on page 13 for scale deck corner numbering.

The indicator must be connected and calibrated approximately, but it need not indicate the exact weight value. A test weight is required. The recommended test weight for all RoughDeck BDP models is 25% of scale capacity; for example, 250 lbs for 1K-lb models, 650 lbs for 2.5K-Lb models.

With no weight on the scale, zero the indicator. Then turn all four potentiometers (Figure 5-1) clockwise to increase the reading until a clicking sound is heard from each potentiometer. This ensures the maximum signal from each load cell.

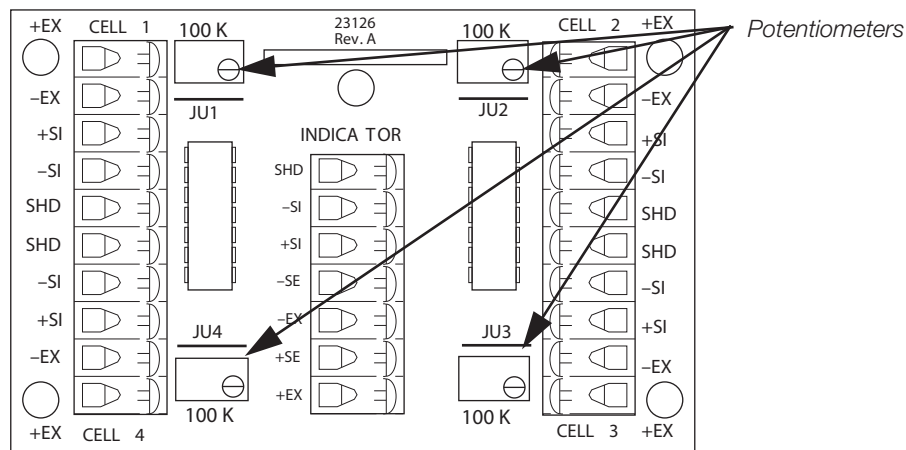


Figure 5-1. Summing Board Diagram

1. Teflon[®] is a registered trademarks of E.I. DuPont.
2. Loctite[®] is a registered trademarks of E.I. DuPont.

With all potentiometers at full signal, place the test weight over one corner and record the indicated weight. Repeat the process for each of the other three corners. The load cell with the lowest corner reading is used as a reference point and will not be trimmed.

Next, place the test weight over one of the other three corners and use that cell's potentiometer to adjust the cell output down to the reference cell output. Repeat this procedure with the other two high corners.

Adjustments are somewhat interactive, and adjusting the three higher outputs may affect the reference cell output, especially in smaller scale decks. Rezero the indicator and repeat the test until all corners read within $\pm 0.1\%$ of the test weight used.

5.3 Calibration Procedure

Refer to the indicator manual to determine correct calibration procedures.

It is recommended that the scale be "exercised" before calibration to be certain that everything is seated. Use the following steps:

1. Load the scale to near capacity two or three times.
2. With no load on the scale, place the indicator in its calibration mode and perform a zero calibration.
3. Place test weights on the platform equal to 70% - 80% of the scale's capacity. If several weights are used, they should be evenly distributed around the platform. Perform a span calibration.
4. Remove the test weights and check the zero reading.
5. Repeat the calibration process if necessary.

6.0 Service Information

The following sections describe basic service and maintenance procedures.

6.1 Troubleshooting Guide

Table 6-1 lists some of the common problems and their suggested solutions.

Problem	Symptom Description	Solution
System does not operate - no display	Power disconnected	Check and reconnect
	Indicator fuse blown	Replace the fuse. Check for cause
	Interface cable cut or disconnected	Repair
	Signal leads incorrectly installed at the indicator	Install according to indicator installation manual
Display stays at zero	Load cell connections faulty	Check cable connections in junction box and at indicator
	Indicator faulty	Service indicator
Erratic weight readings	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 and See Section 5.3 on page 10
	Load cells faulty	Test and replace load cells if necessary
	Feet touching deck underside	Adjust feet downward to provide clearance

Table 6-1. Troubleshooting Table

6.2 Periodic Maintenance

The space between the platform side and the portable deck assembly, 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 permanently mounted in pits.

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.

6.3 Load Cell Replacement

Lift the scale with a chain and remove foot, then remove the defective load cell. Disconnect load cell cable from the junction box and cut cable ties. When the cable is freed, pull cable out of the scale frame channels.

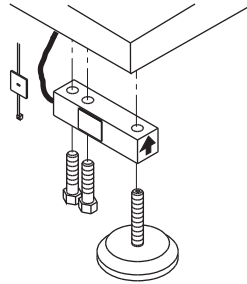


Figure 6-1. Load Cell Assembly

Follow the steps below to install new load cells.

1. Lay out the four load cells near the corners where they are to be installed.
2. Thread the cable from each load cell in the frame and into the junction box according to the wiring diagram in Figure 6-2.

Note that in Figure 6-2 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 6-4 13.

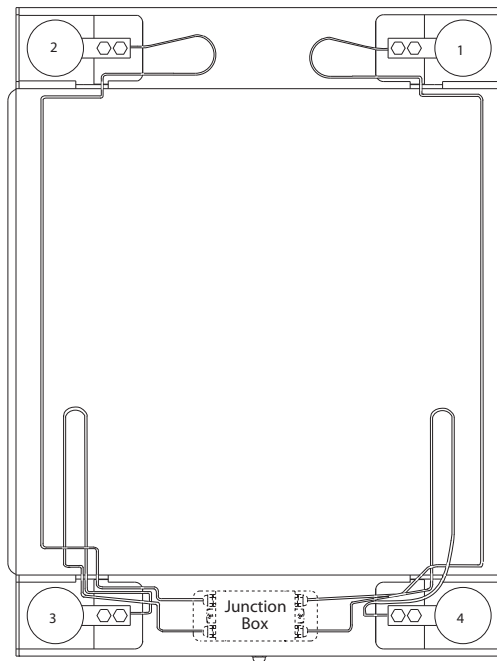


Figure 6-2. Bottom View of Scale

3. Check that the threaded holes for the load cell screws are free of debris. Use compressed air to blow out holes if necessary.
4. Position load cells with alignment arrows pointed up toward the deck and loosely install the hex head cap screws provided, as shown in Figure 6-1. If the base is used with an access ramp, position the load cell to maintain the dimension shown in Figure 6-3. With the torque wrench, tighten all bolts to 75 ft-lbs.

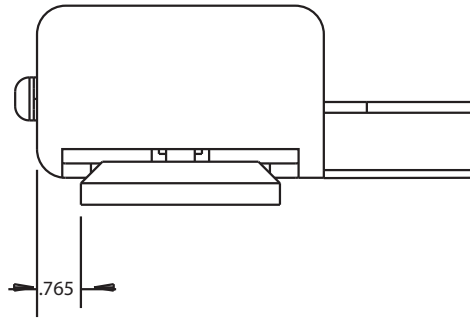


Figure 6-3. Foot Pad - Side View

5. 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 supplied adhesive-backed cable ties.

NOTE: Do not cut load cell cables. Coil the extra cable and slide it into the scale between the top and bottom plates. A slot in the main channel is provided for this purpose.

6. After coiling excess cable, pass each individual end of load cell cable through its grommet in the junction box cover (or through cable fittings in the NEMA 4X junction box).

NOTE: Corner correction trimming and calibration is necessary after load cell replacement. Follow instructions in Sections 5.2 and 5.3.

6.3.1 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 6-4, and the coloring code in Table 6-2.

Pull excess cable out of the junction box enclosure and tighten the cable grips with a wrench. To be watertight, the cable grips must be tightened to the point where the rubber sleeving begins to protrude out of the hub. Finally, pull on each of the four cables to make sure that they do not slip.

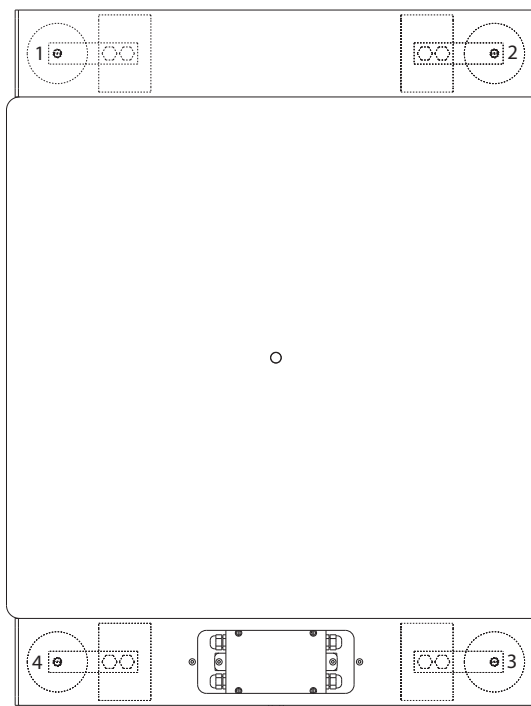


Figure 6-4. Corner Numbering - Top View of Scale

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

Table 6-2. Load Cell Wiring

7.0 Replacement Parts List

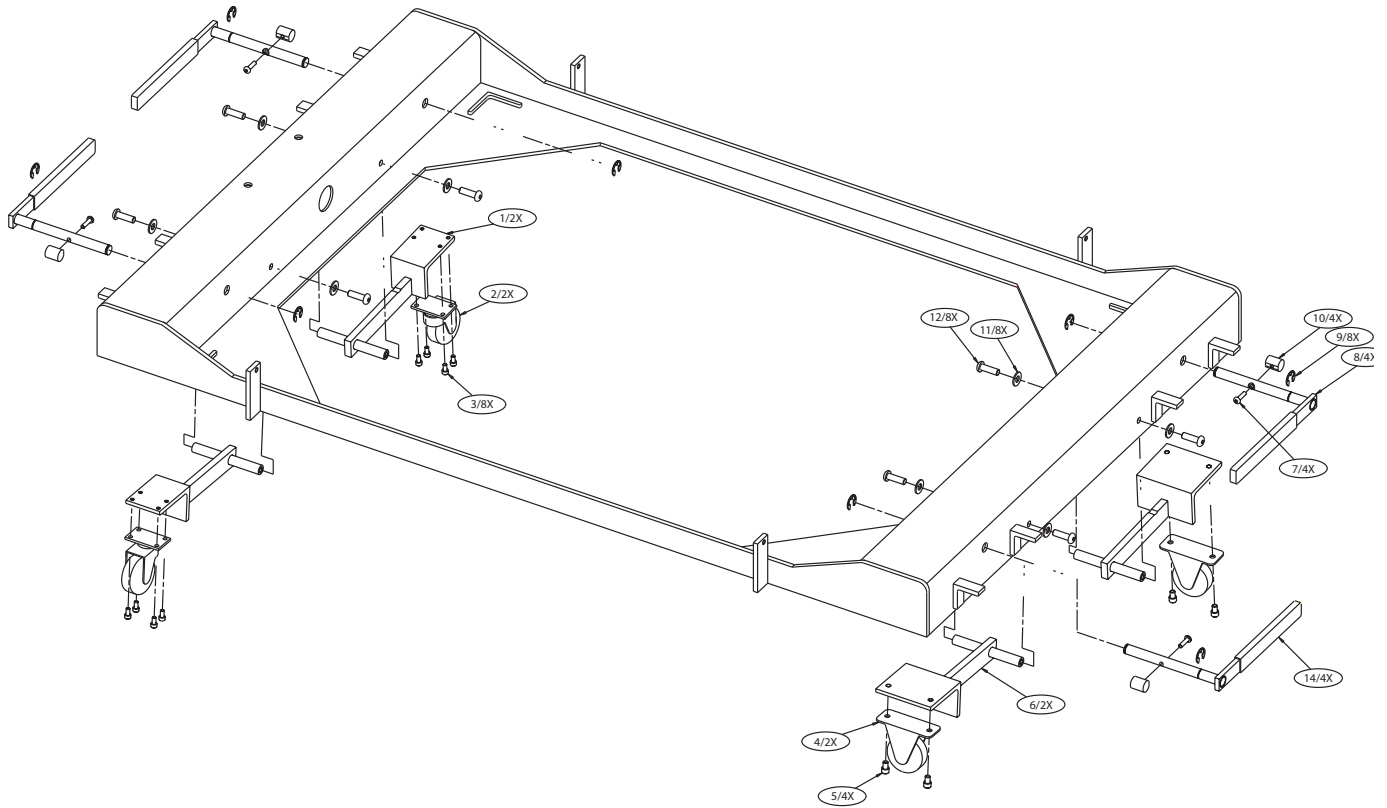


Figure 7-1. RoughDeck BDP Replacement Parts

Ref Number	Description	RLWS Part Number Mild Steel	RLWS Part Number Stainless Steel
1	Swivel caster support (2)	78426	78463
2	Caster swivel (2)	78841	78841
3	Cap screw, 10-32NF x 3/8 (8)	14931	79119
4	Caster rigid (2)	78842	78842
5	Screw, 1/4 - 20NC (4)	14952	35129
6	Caster support (2)	78430	78467
7	Cap screw, 10-32NF x 3/4 (4)	14938	79073
8	Caster handle (4)	78437	78437
9	Retaining ring (8)	79418	47713
10	Cam (4)	78988	78988
11	Nylon washer 5/16 (8)	79024	79024
12	Screw, 5/16-18NC x 3/4 (8)	72359	79133
14	Grip handle (4)	78434	78434
—	Junction box with EL604STA board	78901	78147
—	EL604STA board only	23126	23126

Table 7-1. Replacement Parts List

RoughDeck Limited Warranty

Rice Lake Weighing Systems (RLWS) warrants that all RLWS equipment and systems properly installed by a Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications as confirmed by the Distributor/OEM and accepted by RLWS. RoughDeck fabricated platforms and weldments are warranted against defects in materials and workmanship for five (5) years. Load cells and all other components are warranted for two (2) years.

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:

- Upon discovery by Buyer of such nonconformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to RLWS for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in a publication, "Protecting Your Components From Static Damage in Shipment," available from RLWS Equipment Return Department.
- 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.
- Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.
- RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways.
- 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.

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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