

# RoughDeck® FXB

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*Flexure Lever Floor Scale*

## Installation Manual



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# 1.0 Introduction

This manual is intended for use by service technicians responsible for installing and servicing RoughDeck® FXB flexure lever floor scales.

The RoughDeck FXB is a flexure lever floor scale. Unlike conventional mechanical scales, the base of a RoughDeck FXB has no moving parts and uses thin high-strength flexure plates that always stay aligned. The FXB is available in sizes from 18" x 24" with a 500 lb capacity to 96" x 120" with a 30,000 lb capacity. NTEP certification exists for models 18" x 24" (500 lb) through 72" x 96" (10,000 lb).

All models use an environmentally protected single "S" type load cell recessed into the frame for protection. Standard models include a mild steel deck, a deck plate, base, flexure plate pivoted levers, and 20 feet of signal cable. Stainless steel covers are optional, and complete stainless steel units can be ordered. See [Section 4.0 on page 10](#) for a complete list of optional equipment.



Manuals and additional resources are available from the Rice Lake Weighing Systems website at [www.ricelake.com](http://www.ricelake.com)

Warranty information can be found on the website at [www.ricelake.com/warranties](http://www.ricelake.com/warranties)

## 1.1 Safety

### Safety Signal 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.



**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.**



**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 than 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 exceed the rated load limit of the unit.**

**Do not make alterations or modifications to the unit.**

**Do not remove or obscure warning labels.**

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

## 1.2 Scale Components

The RoughDeck FXB has six major components as shown in Figure 1-1. Those components and their descriptions are listed in the following table.

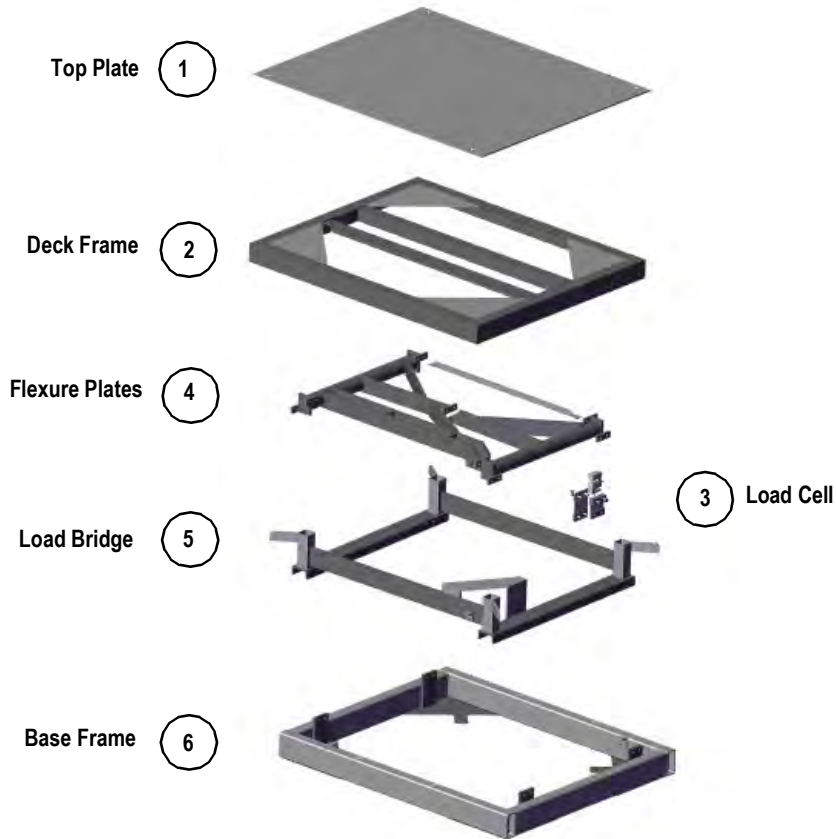


Figure 1-1. RoughDeck FXB Parts Breakout Diagram

Item No.	Component	Description
1	Top Plate	A rigid welded frame unit with a removable deck plate upon which weight is placed; the applied load is transmitted from the weigh platform, to the load bridge, to the levers, and then to the load cell
2	Deck Frame	Supports the top plate
3	Load Cell	Electronic force measuring device mounted in a corner of the scale and rigidly fixed to the load bridge structure. Wire rope runs from one end of the load cell to the tip of the primary lever
4	Flexure Plates	Flat, high-strength thin plates that transmit the load forces due to the weigh applied to the platform and to the lever system. The flexures provide maintenance free pivot point that supports the levers from the base and transmits forces from the load bridge to the levers and on to the load cell
5	Load Bridge	Two pieces of tubing or channel iron, one on either side of the scale and tied together by two cross members. The weigh platform is supported by the load bridge through four platform support pipes. The load bridge is suspended from the lever system through the load flexures
6	Base Frame	A rigid one piece, welded unit that supports the remaining scale system. The fulcrum flexure support stands are welded directly to the base frame

Table 1-1. RoughDeck FXB Scale Components

### 1.3 Operating Requirements

The following is a list of operating requirements necessary to operate the RoughDeck FXB flexure lever floor scale.

#### Electrical Grounding

For systems where the scale is connected to a 120 VAC circuit, the instrument must be directly connected to an earth ground with a ground cable that has no more than three ohm resistance throughout its length and connections.

#### Grade Level Requirements

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

#### Load Cell Excitation

Rated Excitation - 10 VDC

Maximum Excitation - 15 V

#### Safe Static Overloading Capacity

Maximum - 150% of the scale capacity

#### Temperature

Compensated range 0 to 150°F (-18 to 65°C).

### 1.4 Flexure Lever Operation

In the RoughDeck FXB, flexure levers replace pivots and bearings for the fulcrum and load and power points on the lever. The multiple of the lever for a flexure is calculated in the same manner as a pivot and bearing lever system. The reference point of the flexure is the center line through the flexure itself (Figure 1-2).

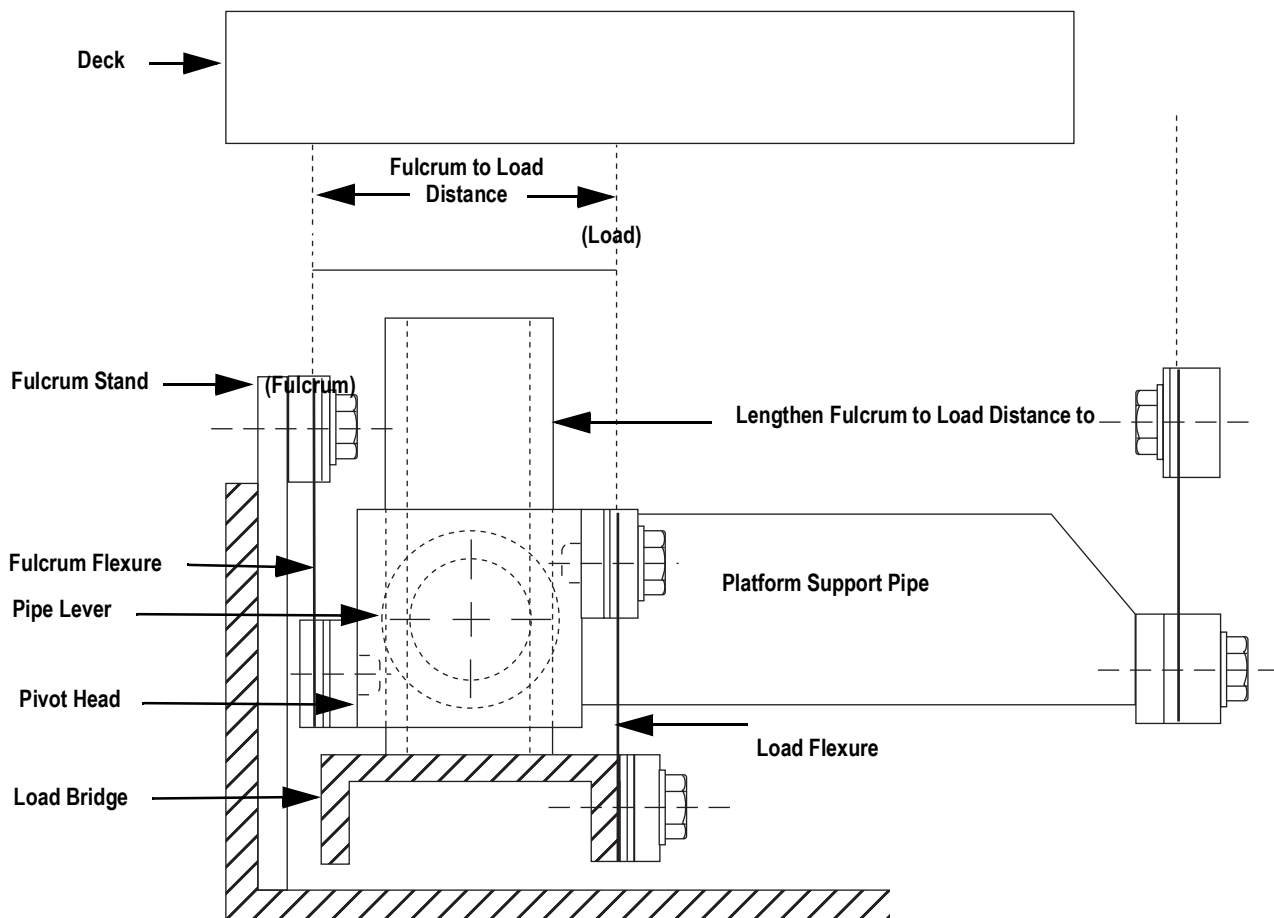


Figure 1-2. How Flexure Levers Work

## 2.0 Installation

The following sections explain how to unpack and properly install the RoughDeck FXB flexure lever floor scale.

### 2.1 Unpacking the FXB

Use the following steps to unpack the FXB.

1. Remove the banding straps and open the shipping crate.



**Do not remove the scale from the packing skid by placing forks from a forklift under the base assembly unless the scale is equipped with optional forklift skids. Moving the scale without skids can damage the load cell and connections.**



2. Remove the top plate and deck frame.



**For small units the top plate and deck frame are welded together and can be lifted by hand. For larger units use fasteners to attach the top plate and deck frame together and use eye bolts to lift, depending on its size.**

3. Lift scale base from the wooden pallet by connecting eye bolts (not included) into threaded holes in the side channels of the scale.

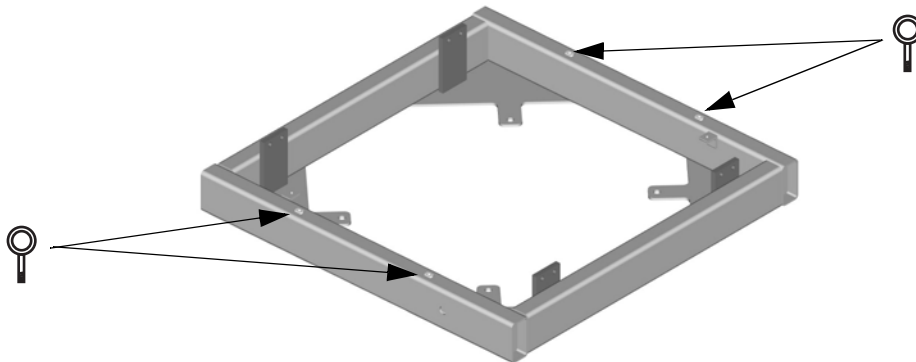


Figure 2-1. Proper Lifting Technique

#### IMPORTANT

**Lift the scale only with a properly designed spreader bar. Lifting force must be vertical to avoid bending the eye bolts. Eye bolts should have a safety rating that will handle the weight of the scale that is being lifted.**



**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.**

4. Remove weigh platform deck plate by removing four counter sunk screws from the top of the scale.
5. Remove the weigh platform frame.



## 2.2 Inspecting the RoughDeck FXB

1. Inspect the unit for signs of damage such as a bent frame, broken or bent flexures and broken welds. This visual inspection is very important and should be performed with great care.
2. Verify that all gripper plate bolts are tight (four bolts holding each flexure plate in place).

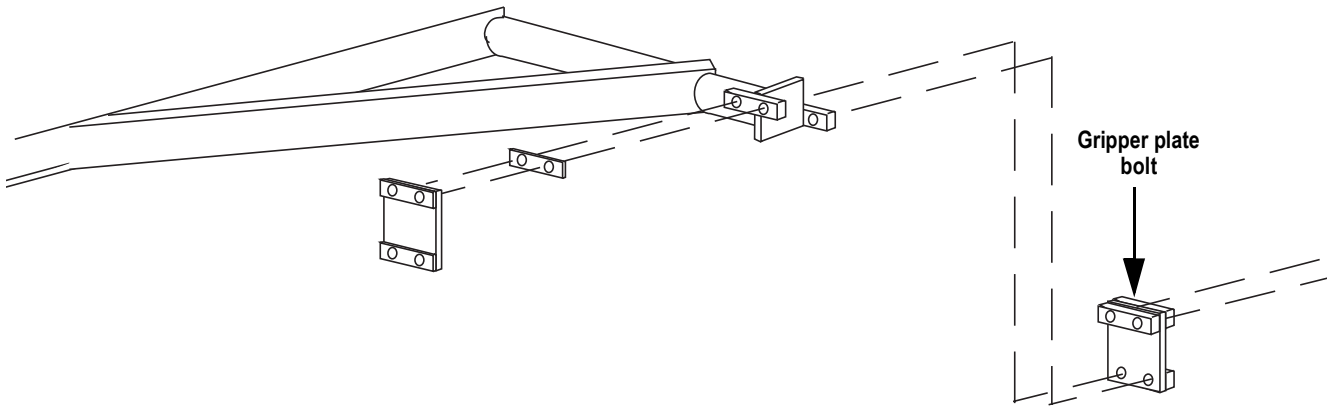


Figure 2-2. Gripper Plate Bolts

## 2.3 Site Preparation

Do not locate the scale where overweight loads would have to maneuver to avoid crossing the platform. Use the following guidelines for site preparation:

- For scales not meant for washdown environments, avoid areas where water may cause damage.
- The interface cable between the scale and the indicator must be protected against crushing, cutting, or moisture damage. Protect the cable by running it in conduit. Do not allow the cable to lay in water.

For proper operation, the scale must be level within a 1/4". 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. After a site is selected:

1. Use hook-end chains to move the scale base to its permanent location. Location should be level and have a solid and stable foundation. An unstable location causes inaccurate or fluctuating weight readings.
2. Verify that the scale base rests firmly on the floor on all four corner gussets. Shim between each gusset and floor as required to attain a firm and stable mounting.
3. Anchor to floor if desired (1/2" anchor bolts not included).

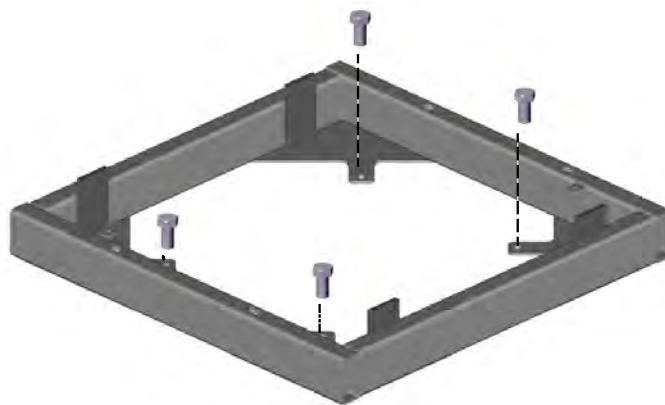


Figure 2-3. Anchor RoughDeck FXB Scale to Floor

## 2.4 Assembly

1. Cut bands holding the load cell package from lever arm and remove the load cell with wire rope.



**CAUTION** *The load cell is a delicate device and can be damaged if dropped, twisted when mounting, or shock loaded.*

2. Insert a block under the primary lever so it fits snugly. Remove the shipping bolt and shipping spacer (not shown). The shipping spacer is placed between the load cell support frame and the nose iron (in place of the load cell) during shipping (see [Figure 2-4](#) and [Figure 2-5](#) on page 7) and is the set distance that must be duplicated when inserting the load cell.
3. The load cell is shipped with wire rope. Remove the outer nut from the load cell wire rope.

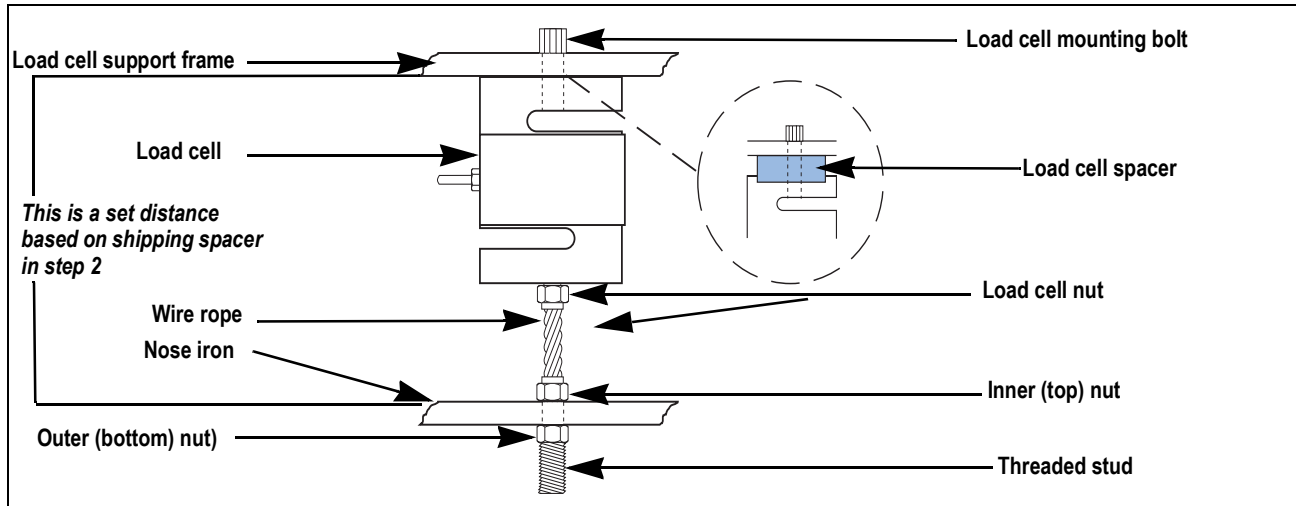


Figure 2-4. Load Cell Setup

4. Screw the inner nut on the wire rope flush with the top of the threads. The inner nut is what is used to set the distance measured from the shipping spacer.
5. Remove the load cell mounting bolt from the top of the cell ([Figure 2-4](#)).
6. Screw the short threaded end of the wire rope with the load cell nut in a position that allows the threaded end to be flush with the top of the lower “S” legs top surface of the load cell. .



**Note** *The weigh platform frame and scale base are marked on the corner near the load cell for proper assembly.*

7. Carefully lower the load cell into position at an angle so the wire rope threaded rod end goes through the hole of the nose iron first. If used, position the load cell spacer between the load cell support frame and the load cell.
8. Position the load cell so the load cell cable will travel directly out of the exit hole in the base as shown in [Figure 2-5](#) on page 7.
9. Position the load cell vertically and lift until it touches the load cell support frame. Align the top hole of the load cell with the mounting hole of the support frame and thread the load cell mounting bolt down through the housing into the load cell. Do not tighten.

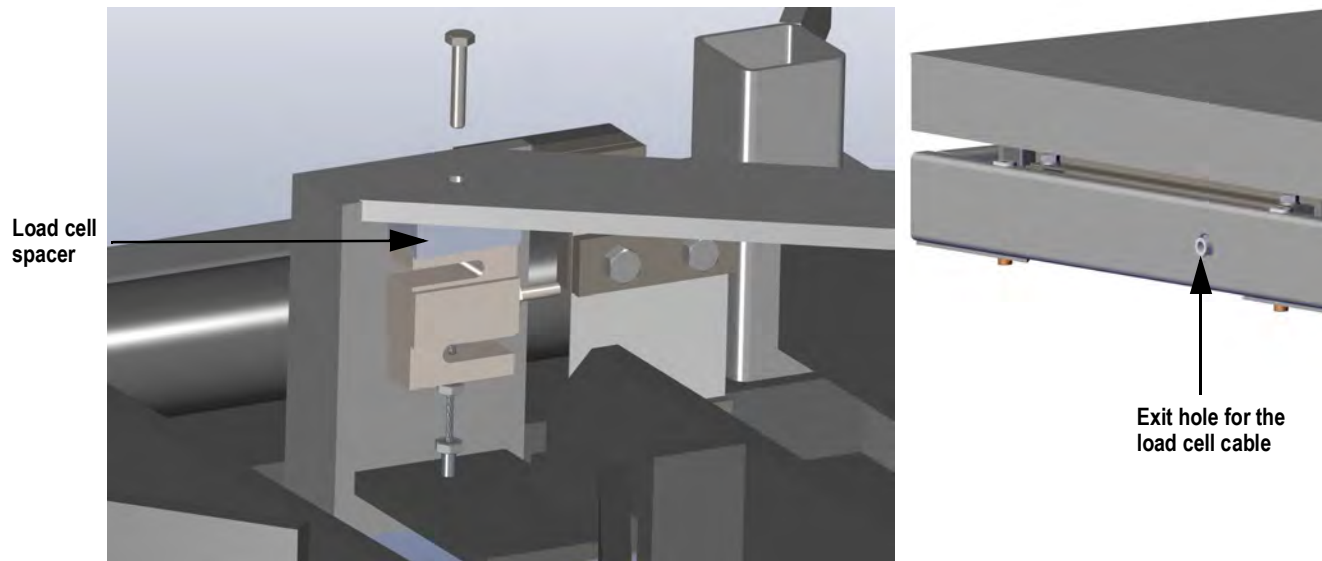


Figure 2-5. FXB Interior

10. Place the bottom nut on wire rope. Do not tighten.
11. Position the load cell so it is not rubbing or touching the sides of the support frame or lever system.
12. The inner nut should be turned down from being flush with the top of the stud (refer to step 4 on page 6), until it makes contact with the nose iron. That should be the same distance as the shipping spacer measurement which is referred to in Figure 2-4 on page 6.
13. Tighten the mounting bolt.
14. Carefully raise the lever nose iron and tighten the bottom nut finger tight. Using a wrench, carefully tighten the bottom nut. Be sure to remove the block from under the primary lever.



**When tightening the bottom nut, do not allow the wire rope to twist. Twisted rope causes side forces in the cell, which cause weight errors when the scale is loaded.**

15. Screw the load cell cable cord grip into the side of the base.
16. Route the load cell cable through the load cell cable cord grip. Verify that the cable is not touching any portion of the live weighing deck or levers.
17. Connect the load cell cable to a digital weight indicator.
18. Inspect under and around the lever arms, pivot heads and load bridge for any foreign material which could interfere with the live portion of the scale.
19. Re-install the weigh platform and deck plate. The scale base is ready for calibration.

## 2.5 Electrical Interface to the Indicator

Twenty feet of 4-wire cable is supplied to connect the scale to the weight indicator. Use the wiring scheme from the following table to connect the RoughDeck FXB to the indicator.

Color Code	Function
Red	+ Excitation
Black	- Excitation
Green	+ Signal
White	- Signal

Table 2-1. 4-Wire Color Codes

To prevent electrostatic discharge, ground the scale base to the earth ground terminal of the same AC power source that is used to power the indicator.

## 3.0 Calibration and Adjustments

The following sections describe how to calibrate the RoughDeck FXB.

### 3.1 Calibration

Use the following steps to calibrate the RoughDeck FXB.

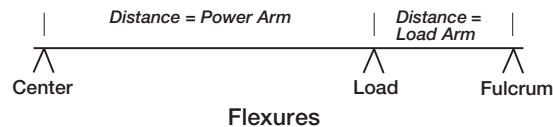
1. Zero balance the digital weight indicator. Refer to your manufactures' operating manual for instructions.
2. Place test weights equal to 70 - 80% of the scale's capacity on the weigh platform and adjust the weight indicator span for the correct reading.
3. Remove the test weights and check zero.
4. Repeat steps 1-3 if the weight indicator does not return to zero.

### 3.2 Mechanical Adjustments

The corners of the scale base are preset. If the corners have extreme differences, check for bent flexures, broken welds, or foreign objects in the corners.

1. Apply test weights equal to 25% of the scale's capacity to each corner in sequence and observe the indicator. Record these weights for reference.
2. If the corner shift reading is within tolerance, do not make any mechanical adjustments. If it is not within tolerance, proceed to step 3.
3. Remove the deck plate and weigh platform frame.
4. Loosen all check link mounting bolts ( [Figure 1-1 on page 2](#) ).
5. Loosen the top and bottom load flexure gripper plate bolts on the corner to be changed ( [Figure 1-1 on page 2](#) ). Bolts do not need to be completely removed.
6. Use [Figure 1-1 on page 2](#) and the exercise below as a guide and perform one of the following:  
Add shims to increase the fulcrum to the load distance which increases weight readings for the corner being adjusted.  
Remove shims to decrease fulcrum to the load distance which decrease weight readings for the corner being adjusted.

$$\text{shim thickness} = \frac{\text{error (lbs.)} \times \text{load arm (in.)}}{\text{load on platform (test weights)}}$$



For example, if:

Load error = 3 lbs

Load arm distance = 4"

Load on platform = 1000 lbs

Then your shim would be .012.

$$.012 = \frac{3 \text{ (lbs.)} \times 4 \text{ (in.)}}{1000}$$

Shims are available in .010" and .030" thickness. Weight readings change in a linear way proportional to shim thickness. For example, if adding a .010" shim increases weight reading 2 lbs on that corner, a .030" shim will increase it 6 lbs.

7. Tighten all check link bolts.
8. Reinstall weigh platform and deck plate.
9. Recheck corners per step 1.
10. Recalibrate the scale as described in [Section 3.1](#).

## 4.0 Optional Equipment

The following options are available for the RoughDeck FXB flexure lever floor scale.

Option	Description
Fork Lift Skids	Two 8" channels mounted on customer-specified centers
Fork Lift Skids w/ Weight Indicator Column	Two 8" channels mounted on customer-specified centers with one channel extended 12" and equipped with a bolt-on pipe stand weight indicator column. The weight indicator display is 54" above the floor. For models larger than 48" x 60", consult distributor to determine the appropriate weight indicator column
Epoxy-Painted Base	An epoxy-painted base with stainless steel hardware
Stainless Steel Sheet Metal Platform Covers	Stainless steel covers for the entire deck top
Stainless Steel Construction	Stainless steel construction of the entire scale base

*Table 4-1. Optional Equipment*

## 5.0 Service Information

The following sections describe various troubleshooting and replacement parts information.

### 5.1 Troubleshooting

Problem	Probable Causes
Shift Error	Center of flexure is offset from the center line Corners are not shimmed tightly to the floor Nose-iron on power lever too high or too low Pivot heads need shimming
Erratic Readings	Bent flexures or cable assembly Center leveling bolts not down far enough, or down too low Corners are not shimmed tightly to the floor Ground shield not connected to cannon plug or meter shield Loose connection in the junction box
Non-linear Weight Reading	Center flexure is offset from the center line Damage to the load cell Misaligned flexure or cable assembly Nose-iron on power lever too high or too low Pivot heads need shimming
Corner Error	Corners are not shimmed tightly to the floor Loose gripper Misaligned flexure or cable assembly Pivot heads need shimming
Zero Change	Corners not shimmed tightly to the floor Damaged load cell Live assembly touching the dead assembly Loose gripper Misaligned flexure or cable assembly Shipping block has not been removed during unpacking Obstruction under the load bridge (probably at the corner)

Table 5-1. Troubleshooting Table

## 5.2 Load Cell Replacement

Replacement load cells can be ordered from Rice Lake Weighing Systems ( [Section 5.3](#)). To replace a load cell in an FXB follow the steps listed below.

1. Remove the deck assembly.
2. Loosen the bottom locking nut ( [Figure 1-1 on page 2](#)).
3. Remove the signal cable access hole cover plate. Pull wire rope from the plate and pass it through base.
4. Remove bottom lock nut from wire rope and back off upper lock nut. Using a hex allen wrench on the flathead bolt, and an adjustable wrench to hold the load cell body, remove the load cell.
5. Remove the wire rope from the defective load cell and screw it into the new load cell to approximate position it was in the old cell.
6. Insert the wire rope into the nose iron hold and turn the lower nut on loosely.
7. Hold flat washer in place, and screw flathead bolt into top of the load cell. Tighten the flathead bolt securely using a hex allen wrench and adjustable wrench.
8. Tighten the lower lock nut on the wire rope against the nose iron (finger tightening only). Lock upper nut down against the nose iron.
9. Pass the signal cable through the access hole and follow directions from [Figure 2-5 on page 7](#)
10. Replace the deck assembly and recalibrate according to [Section 4.1 on page 9](#).

## 5.3 Replacement Parts List and Accessories

Please refer to the Replacement Parts catalog, PN 32288 or the Rice Lake Weighing Systems website at <https://www.ricelake.com/en-us/resources/catalogs> for a complete list of replacement parts and accessories for the RoughDeck FXB.







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