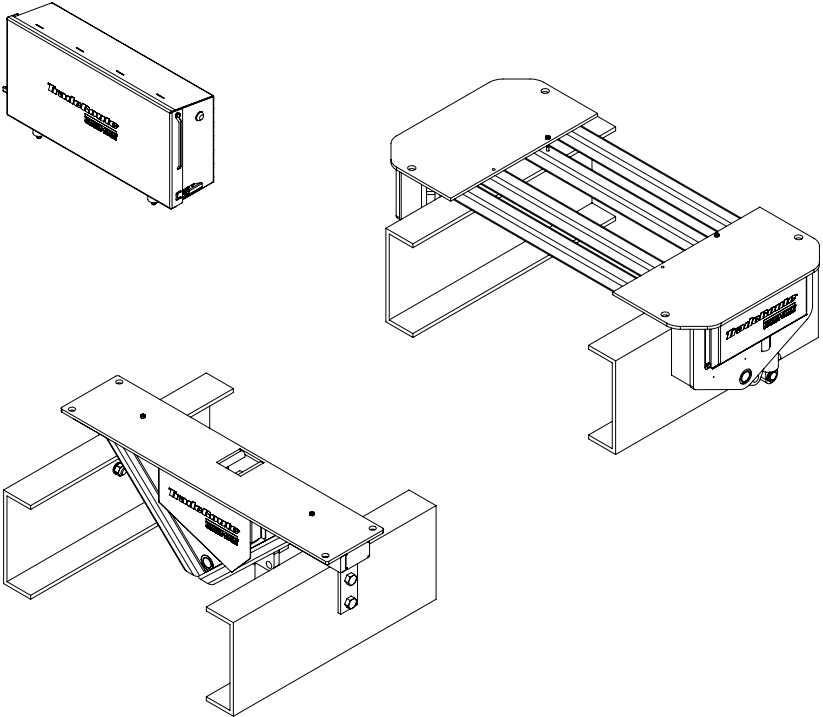


TradeRoute™

HL Series

Installation Manual



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Revision History

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

Revision	Date	Description
I	February 18, 2025	Established revision history, updated images

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

TradeRoute is manufactured with top quality components and is engineered using the latest technology to provide exceptional operating features and reliability to last for years to come. Please read this manual completely before attempting to use the system. TradeRoute has been designed for easy setup and use. A thorough understanding of this manual will ensure that you receive the maximum benefit from the system.



Manuals and additional resources are available on the Rice Lake Weighing Systems website at www.ricelake.com

Warranty information can be found on the website at www.ricelake.com/warranties

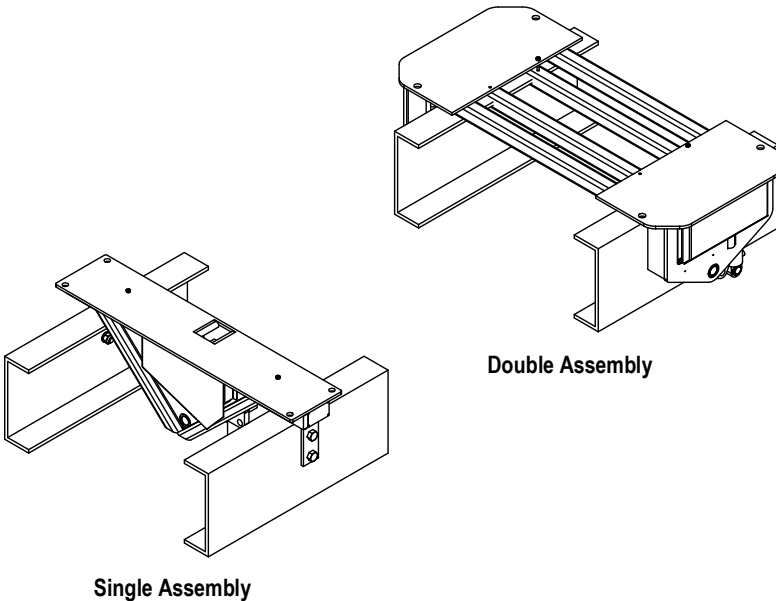


Figure 1-1. TradeRoute

1.1 Safety

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.



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. Contact any Rice Lake Weighing Systems dealer for replacement manuals.



WARNING

Failure to heed may 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 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.

1.2 Overview

TradeRoute is a patented, Legal for Trade, NTEP and Measurement Canada approved, mobile weighing device.

TradeRoute has a height profile of only 2-3/8 in. This allows a truck's center of gravity to remain practically unchanged. The entire package is designed so that it is almost unnoticeable to avoid detracting from the appearance of the unit. The scale modules come pre-assembled for ease of installation.

Features and benefits of the TradeRoute system include:

- Quick transition between weigh and transport position (about three seconds).
- Off level operation. TradeRoute can be used in very hilly terrain since it can operate up to six degrees out of level in any direction.
- The measurement received from the scale is shown directly in lb or kg; so conversion from gallons or liters is not necessary.
- The entire system is temperature compensated so it can be used at any time of the year in all weather conditions.

1.3 Important Installation Notes

When installing the TradeRoute system:

- Do not weld to any part of the scale system. Electrical currents required for welding can damage the load cells.
- Clearance of at least two inches must be allowed between anything that is a part of the scale (lift plates, container) and anything that is not part of the scale (truck frame, bumper, axles, wheels, truck cab).

1.4 Vehicle and Container Selection

Vehicle selection is an important part of the installation process. When mounting the TradeRoute on a truck frame, be sure to select a truck that will carry the load and be properly balanced.



IMPORTANT: Scales must be installed on a rigid base for accurate weighing. Installer must avoid a chassis that has the possibility of excessive flexing or not be able to remain rigid during lifting and weighing process.

The container used to transport product must also be suitable for use with the TradeRoute system. The container (tanks and body) must be capable of supporting its own weight plus the total weight of product at two locations along its length.



IMPORTANT: If this is not practical, a frame must be built to support the container in the weigh position.

1.4.1 Vehicle Requirements

1. Truck frame width (outside to outside) must be between 33½ in and 35 in.
2. Truck frame behind the cab must be as long as the container plus 6 in to 12 in.
3. There must be enough axle capacity for the container, product, and scale components.
4. Trucks must have a bumper attached to the truck frame.
5. Fenders must be attached to the truck frame, not to the container body.
6. If truck is equipped with lift gates, they cannot attach both to the body and chassis.

1.4.2 Hydraulic Requirements



WARNING: When working with hydraulic hoses and fittings, avoid a hazardous release of fluids by relieving pressure before disconnecting. Securely tighten all connections before applying pressure.

Truck requires a hydraulic pump with the following specifications:

1. Maximum pressure capability of 3000 psi (pressure is usually set to approximately 1800 to 2000 psi).
2. Minimum flow of 5 GPM (lower flow is acceptable, but will increase the time to raise and lower the scale into and out of weighing mode).
3. If used with other hydraulic control valves, pump must match the control valve (i.e., open center pump with open center valve and constant volume).

1.5 Scale Selection

The capacity of the scale selected must be able to carry the empty weight of the container/delivery body (tare weight) plus the maximum product that can be carried by the container (maximum net weight). Use the following chart to select the proper scale capacity.

Capacity Required	OB5-SGL5	OB10-DBL5	OB10-SGL10	OB20-DBL10	OB15-SGL15	OB30-DBL15
15,000 lb (7000 kg)	1	1				
20,000 lb (9,000 kg)		2				
30,000 lb (13,500 kg)			1	1		
40,000 lb (18,000 kg)				2		
45,000 lb (20,000 kg)					1	1
60,000 lb (27,000 kg)						2

Table 1-1. Number of Assemblies Required by Capacity

1.6 Weight and Balance

The objective of the weight and balance calculation is to determine the truck's resulting axle weights when the system is installed. It is important that the allowable axle weight limits of the truck and allowable road limits are not exceeded.

A worksheet outlining the calculation is shown on the following page.

1. Measure the wheelbase of the truck. This is the distance from the front axle to the center of the rear axle group.
2. Obtain the initial axle weights of the truck without the container (delivery body).
3. Allow a minimum clearance of two inches from any part of the scale (scale frame, tanks) to any fixed obstruction on the truck (cab, exhaust stacks). This is required for proper scale operation.
4. Estimate the center of gravity of the container or delivery body. The center of gravity can usually be estimated as the center of the container.
5. Select a starting position for the body or container on the truck frame. The container center of gravity must be ahead of the rear axle group.
6. Assuming the starting position as previously described, determine the forward distance (FD) from the center of the rear axle group ahead to the body's center of gravity. This dimension can be calculated or measured with a tape measure.
7. Determine the total weight of components being installed on the truck.
8. Determine final axle weights using the equations below the worksheet.



NOTE: If one of the axle weights is greater than the allowable limit for the truck or roads, shift the body forward (to lower the rear axle weight) or backward (to lower the front axle weight), keeping in mind points 3, 5 and 6 above.

9. Extend the truck frame if required. If the weigh module hangs past the end of the truck frame, the truck frame must be extended. The truck frame must be at least even with the end of the weigh module. It is recommended that the truck frame extend a minimum of one inch past the weigh module.
10. It is preferred that the rear bumper be mounted directly to the truck frame.

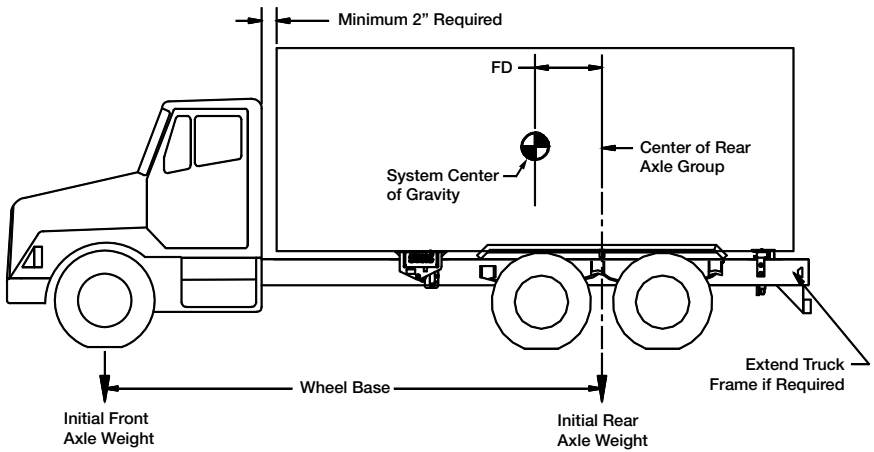


Figure 1-2. Weight and Balance

	Approximate Weight of Components (lb)			
	5000* or 10000*		15000*	
	3 point	4 point	3 point	4 point
Container(s) Tare (empty) Weight				
Maximum Product Weight				
Scale Parts (approx.)	450	550	575	720
Total Weight of Components				
*5000 lb-----OB5-SGL5 and OB10-DBL5				
*10000 lb-----OB10-SGL10 and OB20-DBL10				
*15000 lb-----OB15-SGL15 and OB30-DBL15				

Table 1-2. Weight of Installed Components Calculation

	Workspace	Example
Wheel base		216 in
Initial Front Axle Weight		6,800 lb
Initial Rear Axle Weight		6,600 lb
Total Weight of Components (see above)		27,600 lb
Forward Distance (FD)		28 in
Final Front Axle Weight (see below)		10,378 lb
Final Rear Axle Weight (see below)		30,622 lb
$\text{Final Front Axle Weight} = \text{Initial Front Axle Weight} + \left(\frac{\text{FD}}{\text{Wheelbase}} \times \text{System Weight} \right)$ $\text{Final Rear Axle Weight} = \text{Initial Rear Axle Weight} + \left(\frac{\text{Wheelbase}-\text{FD}}{\text{Wheelbase}} \times \text{System Weight} \right)$		

Table 1-3. Weight and Balance Calculation

2.0 Scale Installation

2.1 Truck Preparation

Before mounting the <H65>Trade<H469>Route system onto the truck, make sure there are no protrusions or mechanical parts on the truck that may interfere with the scale operation. Remove any parts that protrude above the c-channel of the truck frame.

2.1.1 Fenders

Fenders are required over the rear wheels of the truck. This prevents mud/dirt accumulation on the scale that can cause erroneous weight indications. The truck fenders must be mounted on the truck frame, NOT on the container body. Allow for a minimum three inch clearance between the fenders and any part of the scale.

2.2 Scale Positioning

The scale must be correctly positioned in relation to the container's center of gravity to ensure proper distribution of weight to the load cells. The following diagrams outline the proper scale positioning for three point and four point scales. For three point systems, Rice Lake Weighing Systems recommends positioning the single cell in the rear to avoid the truck's driveshaft. There is no front or back to the modules; they can be attached in either direction. Some factors to consider when positioning the modules are:

- Accessibility for service
- Space for attachment of test weights to the lift plates of the scale system
- Avoidance of bolt heads on the truck frame
- Avoidance of other protruding components on the truck frame
- Ease of hydraulic plumbing and wire routing
- Location of reed switch alarm, installed at front of truck

It is important to position the scale far enough away from axles and tires so weight hangers and test weights can be attached to the lift plates for balancing, calibration, and approval. The test weights, when attached to the scale, must clear all obstructions at all operative angles (six degrees in all directions). See the Figure 2-1 and Figure 2-2 for details.

2.2.1 Three-Cell System

(One single and one double cell assembly)



NOTE: The distance from the container's center of gravity to the single load cell assembly must be double the distance from the container's center of gravity to the double load cell assembly.

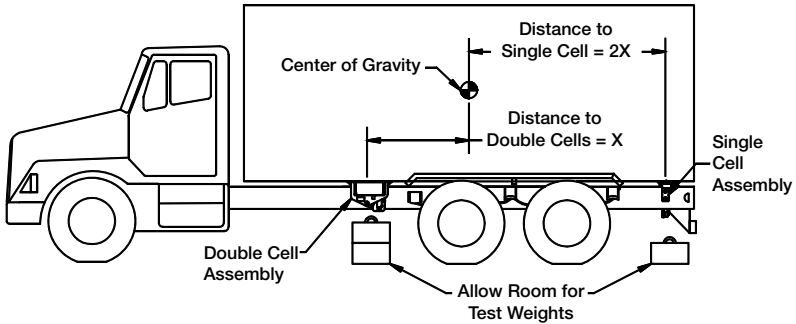


Figure 2-1. Double / Single Scale Positioning

2.2.2 Four-Cell System



NOTE: The distance from the container's center of gravity to the front load cell assembly must be equal to the distance from the container's center of gravity to the rear load cell assembly.

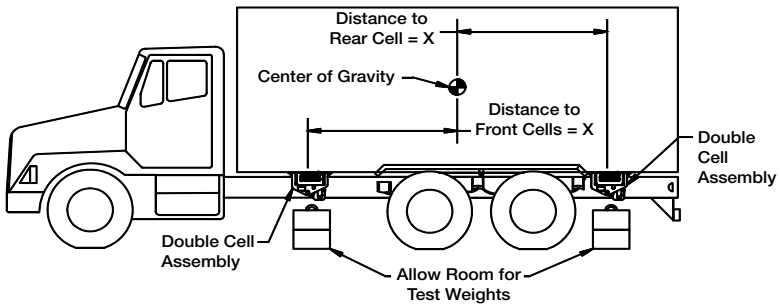


Figure 2-2. Double / Double Scale Positioning

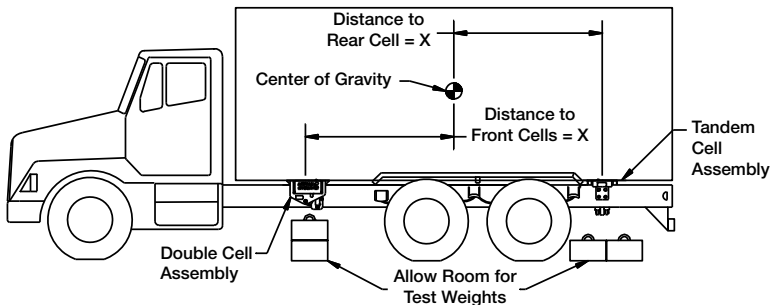


Figure 2-3. Double/Tandem Positioning

2.3 Attachment of Scale to Truck

1. Position the scale modules on the truck frame as described in the previous section.
2. Mark the location of the bolt holes to be drilled through the truck frame, and move the scale away.
3. Drill 7/8 in holes through the channel of the truck frame.
4. Reposition the scale, aligning the holes.
5. Insert shims (flat washers) between the truck frame and the scale (equal amount on both sides). Bolt the scale to the truck frame using the 3/4 in x 2 1/2 in grade 8 bolts, 3/4 in nuts, and 3/4 in lock washers supplied.
6. Torque the 3/4 in bolts to between 90-110 ft-lb.
7. Remove shipping alignment bolts.

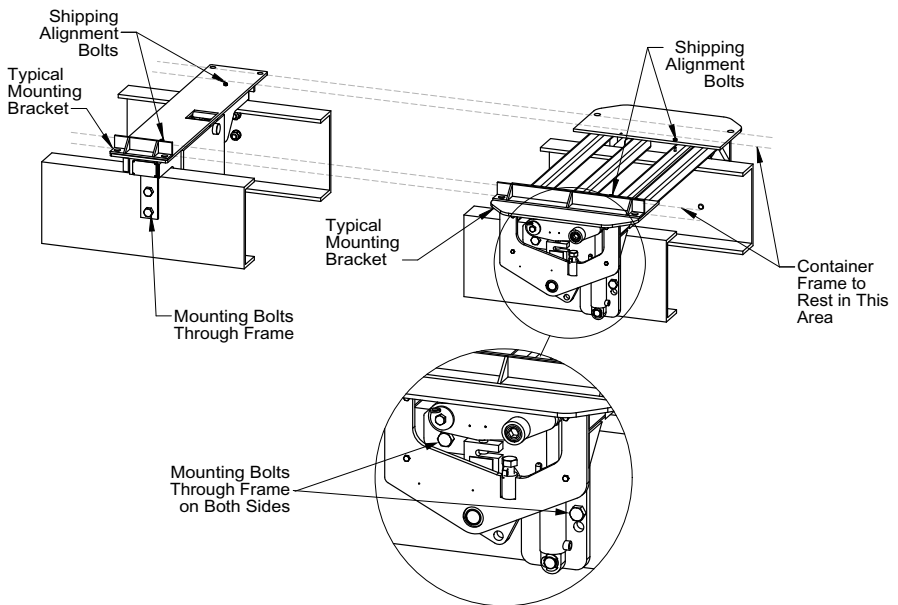


Figure 2-4. Attachment of Scale to Truck Frame

2.3.1 Supporting the Truck Body

Whether the body type is a tank, box, flatbed or tip body, the installer needs to provide for support of the body runners before, after and between the scale modules, when the scale is seated and in the transport mode. These supports can be simple square tubing sections or other material used to fill the gaps between the body and truck chassis in the transport mode. For example, Figure 2-5 shows attachments to a stainless steel body of folded stainless plate welded to the body underside. It is fit with hardwood sections internally that ride on the chassis rail when the scale is down. Bolts are used to capture the hardwood sections inside the folded plate sections for the gaps at front, rear and middle of the body.



Figure 2-5. Stainless Steel Support



Figure 2-6. Support Spacer on an Aluminum Body

Figure 2-7 shows simple closed square tubing sections riding on the chassis rails that are bolted to the chassis with flanges on each section. This method also provides full support of the body during transport mode when the scale is seated.

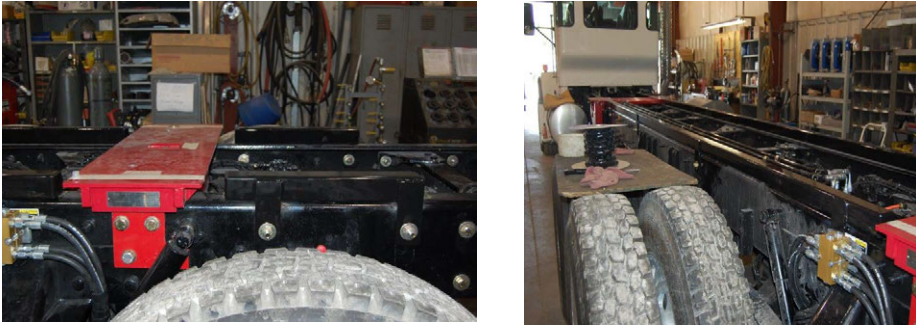


Figure 2-7. Simple Closed Square Tubing Support

Figure 2-8 shows a technique for tipping body applications used for supporting a dump body sub-frame at the scissor ram while the body is being tipped. The scale can be used to take weight readings only when the dump body is down.



Figure 2-8. Tipping Body Applications



NOTE: Always verify the scale is properly seated when down by checking that the load cells are disengaged. To verify this, jiggle each load cell slightly.

2.4 Attachment of Container to Scale

Once the scale modules are attached to the truck frame, the container can be attached to the scale.

Mounting brackets must be attached to the container to bolt the container to the scale. Mounting hole dimensions are shown in the following figures. Rice Lake Weighing Systems recommends the following bolt sizes for attaching the container to the scale.

System Size	Hole Drill Size	Bolt Size	Torque Spec (ft-lb)
5000 or 10000	3/4 in	5/8 in Grade 8	70 – 90
15000	7/8 in	3/4 in Grade 8	90 – 110

Measure distance D from module to module to determine distances between mounting brackets on the container. All hole dimensions must be $\pm 1/16$ in



IMPORTANT: Shipping bolts shown below are used for shipping and keeping the load cell assemblies aligned during installation. They must be removed as soon as the container is attached to the scale and before testing hydraulics.

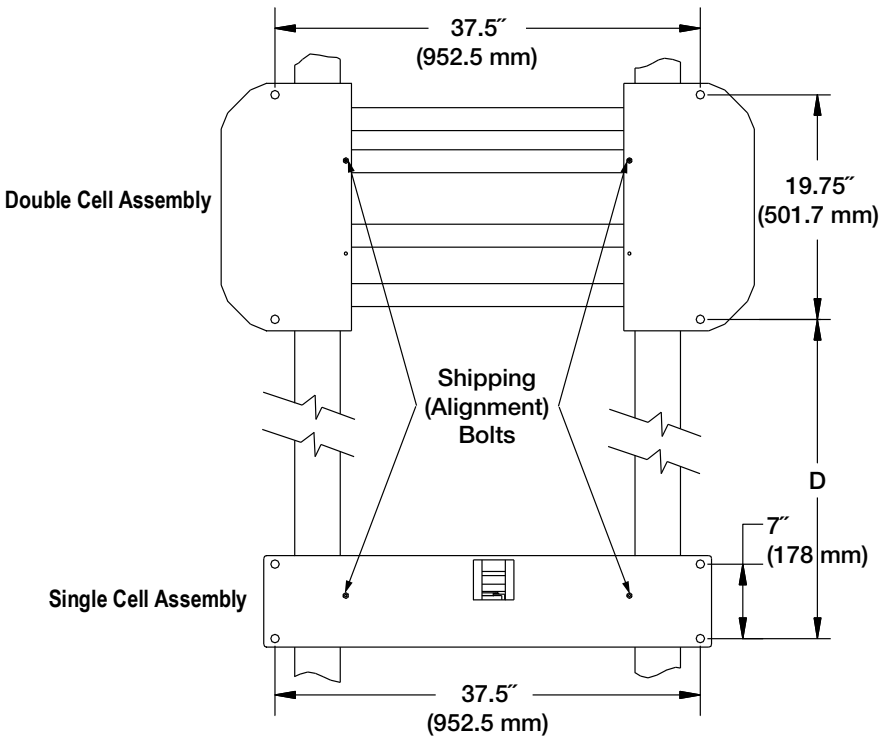


Figure 2-9. Mounting Hole Dimensions

2.4.1 Tip Body Mounts Installation Instructions

An auxiliary frame mounted to the on-board system is necessary for the dump mechanism to function. Figure 2-10 illustrates part of a truck frame with the on-board system mounted.

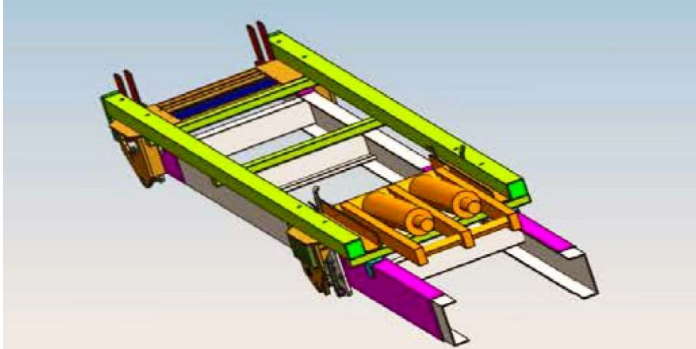


Figure 2-10. Auxiliary Tip Mount

The hydraulics and pivot are mounted to the frame so that the dump system is lifted by the on-board scale. Overall dimensions of the sub frame (tip body mount) are approximately 11 in x 43 in x 189 in.

The following steps illustrate how the tip body mount should be installed.

The on-board pivot is completely removed from the truck frame and attached only to the auxiliary frame as shown in Figure 2-11.

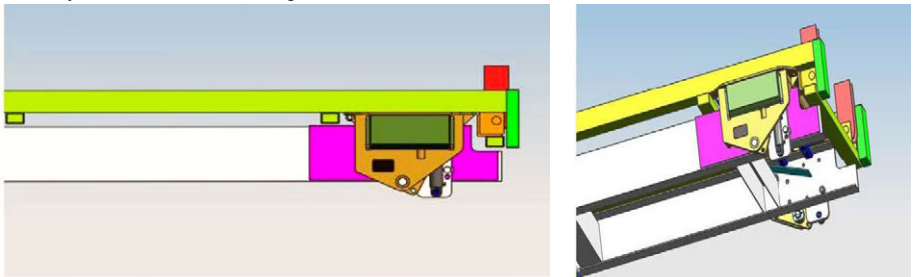


Figure 2-11. On Board Pivot Removed

The lift mechanism, which is mounted to the auxiliary frame and pivot are necessary for the scale to work properly. All load must be carried by the load cells.

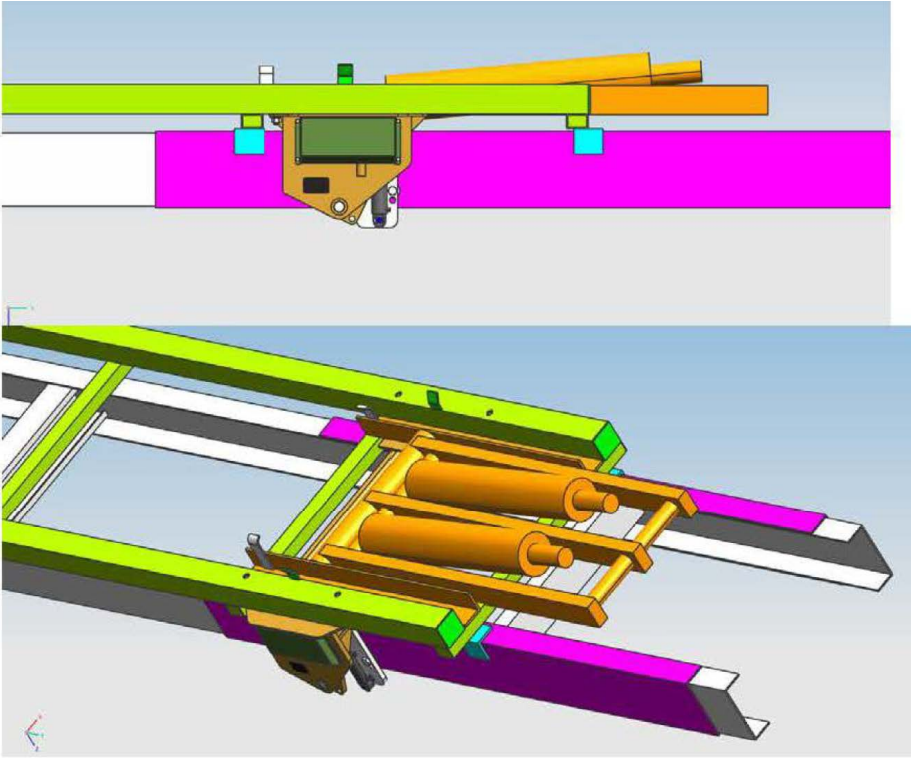


Figure 2-12. Lift Mechanism Mounted to Auxiliary Frame

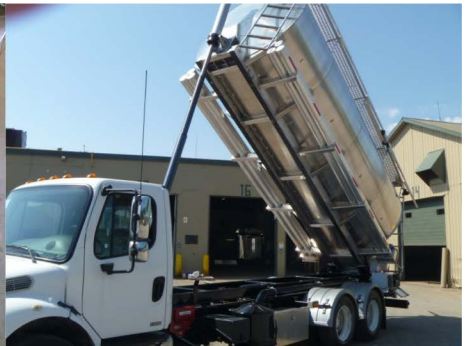
Example Rear Hinge Pivot Illustrations



Tipping Tank Body Pivot Positions



Smaller Body Tipping Subframe



Heavier Application Subframe

Figure 2-13. Rear Hinge Pivot Examples

Example Lift Cylinder Mount Illustrations



Single Front Ram Mount



Mid-Position Scissor Ram Mounts

Figure 2-14. Lift Cylinder Mount Examples

Example Finished Tip Body Installation Examples



Kiosk at Rear of Tip Tank

Junk Collection Tip Body Installation

Figure 2-15. Finished Tip Body Installation Examples



IMPORTANT: Due to the enormous variety and variations of dump body applications, installers are responsible for engineering the scale subframe design that are best suited in each case. Rice Lake Weighing Systems does not provide engineering services for designs or recommendations of subframe types. The TradeRoute Installation manual only shows installers some concepts of designs that have been used in the past.



IMPORTANT: The installer must ensure that (a) the tip body controls cannot be activated while the scale is in the UP or WEIGH position, and (b) the vehicle cannot be driven while the scale is in the UP or WEIGH position as these can result in damage to components and an unsafe operating condition.

2.5 Hydraulic Assembly

Included with each scale module is hydraulic plumbing from the cylinders to the line locks.

2.5.1 Cylinders to Line Locks

A diagram of the hydraulic assembly from the cylinders to the line locks is shown in Figure 2-16.

1. Attach the line locks to the truck frame, using the bolts, nuts, and washers provided. Position the line locks so there is some slack in the hoses to allow for cylinder motion.
2. Thread orifices into the lower ports of the cylinders. This is an ORB (SAE) o-ring fitting. Ensure the o-ring is on the fitting.
3. Thread fittings into the upper part of the cylinders. These fittings do NOT have an orifice. Ensure the o-ring is on the fitting.
4. Thread hoses into the C1 & C2 ports of the line locks.
5. Thread hoses into the fittings on the cylinders.

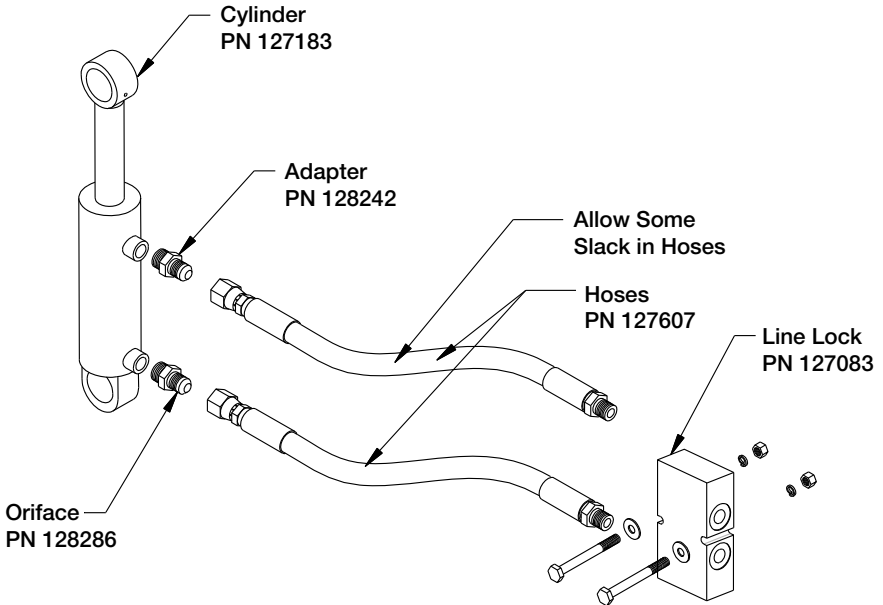


Figure 2-16. Assembly of Hydraulic Components

2.5.2 Line Locks to Valve

The system must be plumbed to a hydraulic source (pump) on the truck through a valve, supplied by installer.

Hydraulic schematics of the TradeRoute systems are shown in Figure 2-17 and Figure 2-18.

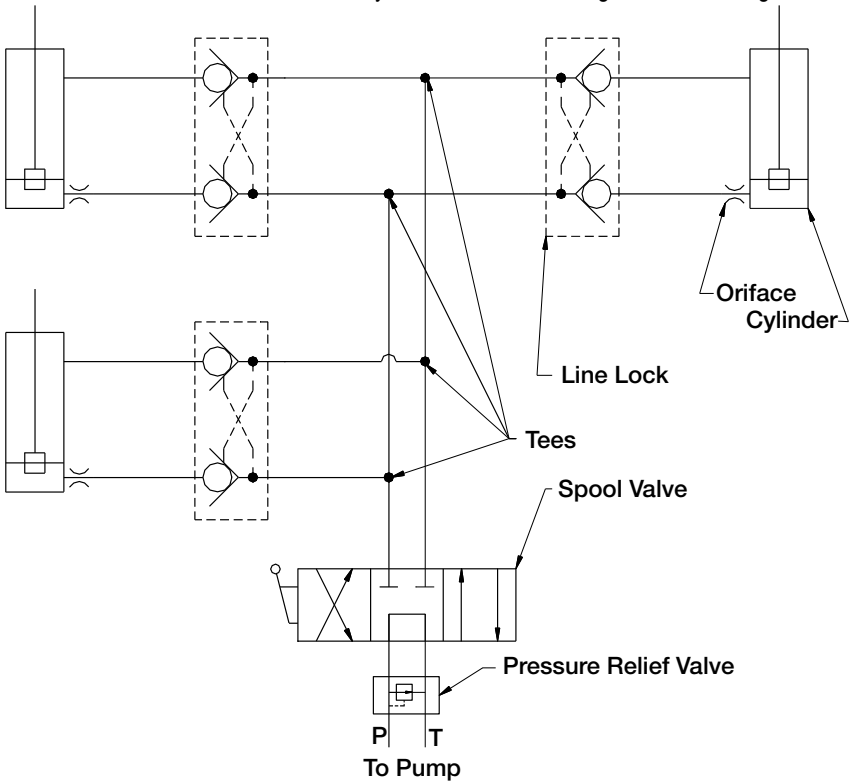


Figure 2-17. Hydraulic Schematic for Three Cell Systems

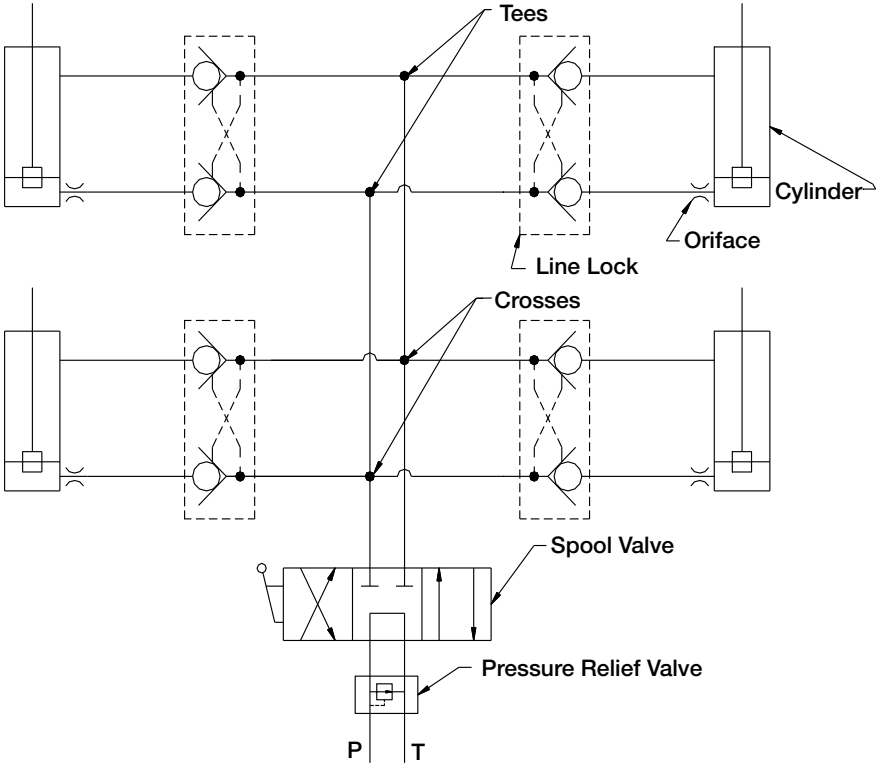


Figure 2-18. Hydraulic Schematic for Four Cell Systems

2.5.3 Valve to Pump

The hydraulic pump on the truck can be plumbed to the control valve. Plumb pressure from the pump to the pressure port on the valve, and plumb the tank port of the pump to the tank port on the valve.



WARNING: Control valves that contain a pressure relief valve require that the pump is protected from over pressurization. This pressure setting may require adjustment depending on the application (consult factory).

2.5.4 Air Removal (Bleed-off) Procedure



NOTE: Before raising the scale, ensure shipping bolts are removed.

During the bleed-off procedure, which removes air from the hydraulic system, some oil will be lost.



IMPORTANT: Do not allow the hydraulic pump to run dry. Serious damage and failure of the hydraulic pump can occur.

1. Plumb the valve to a hydraulic power source and hydraulic reservoir. This can be the hydraulic source on the truck or a portable power pack.
2. With the cylinders down, loosen the top fitting of one of the cylinders. Place a pail or can under the fitting to catch oil.
3. Raise and lower the scale. Continue raising and lowering until the oil coming out of the top fitting is clear (not bubbly or creamy).
4. Tighten the top fitting.
5. Repeat steps 2 through 4 for all other cylinders.
6. Repeat steps 2 through 4 for the bottom fittings of all cylinders.

2.6 Mounting the Small Junction Box (JB4SS)

The junction box should be mounted in a location that is convenient for servicing and away from standing water. Try to mount the enclosure in a location so that the load cell cables need not be cut, nor length added. Load cell output is temperature compensated for the supplied cable length. Altering that length can change the cell's signal output.

Depending on the mounting surface, the JB4SS enclosure can be attached using two pan-head screws, bolts, or other suitable fasteners. Figure 2-19., shows the dimensions for mounting the enclosure.

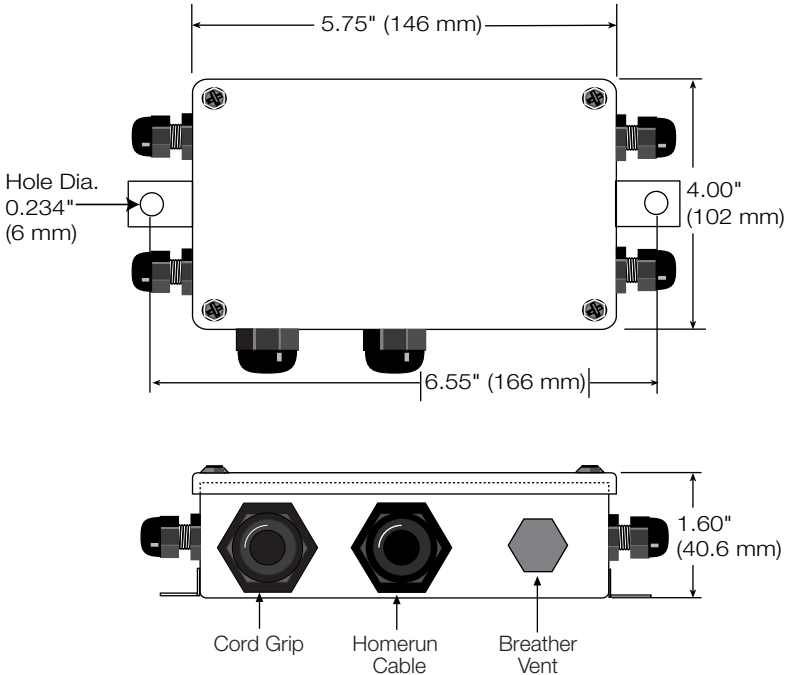


Figure 2-19. JB4SS Enclosure Dimensions

2.7 Lock Down Bolt Adjustment

The lockdown bolt is adjusted at the factory. However, to ensure proper lockdown of the container, check the lockdown bolt height adjustment.

The lockdown bolt should be adjusted so that the hydraulic cylinder is extended minimum 1/8" to maximum 1/4" when locked down (see Figure 2-20). The load cell should be loose in the lockdown position.

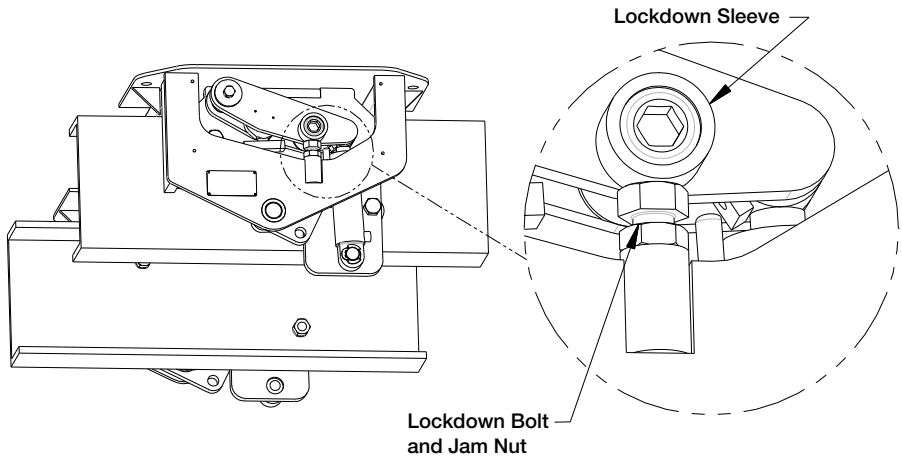


Figure 2-20. Lockdown Adjustment

2.8 Electronic Weigh Center Mounting

A suitable location must be found for the electronic weigh center. Rice Lake Weighing Systems recommends mounting the electronic weigh center near the front driver's side corner of the container. However, the location for the electronic weigh center is application specific and is dependent on the end user's needs.



IMPORTANT: The electronic weigh center must be mounted level with the scale. The weigh center contains a level switch that detects the degree to which the scale is off level. Therefore, the weigh center must be mounted level with respect to the scale.

2.8.1 920i[®] Electronic Weigh Center

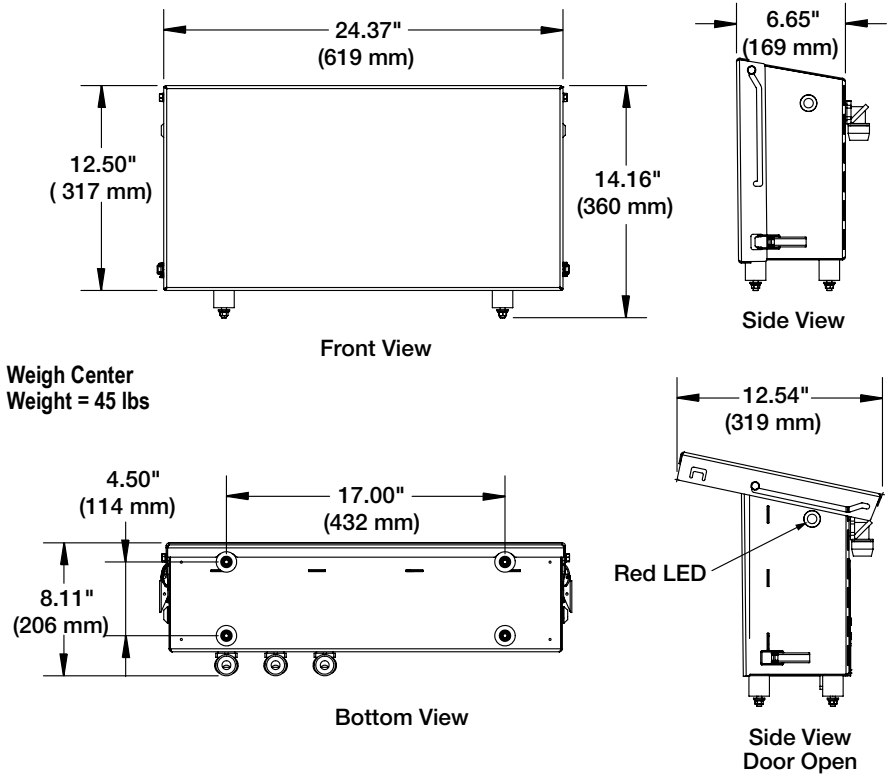


Figure 2-21. 920i Electronic Weigh Center Dimensions

The electronic weigh comes standard with vibration mounts to protect the indicator. A bracket (plate with holes) is required. Ensure the bracket is attached level with the scale (see above).



NOTE: Electronic weigh center mounting brackets are available from Rice Lake Weighing Systems with drawings provided that are suitable for manufacturer.



IMPORTANT: The red LED on the sides of the weigh center must be viewable through the driver's rear view mirror to alert the driver when the system is in the weighing mode.

2.9 920i Electronics Installation

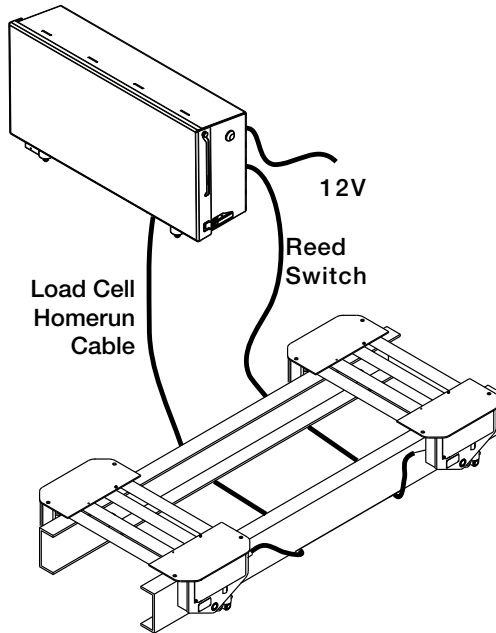


Figure 2-22. Exterior Electronic Weigh Center Connection

The scale electrical system consists of an electronic weigh center, load cells, reed switch and junction box. The load cells are connected to the indicator via a summing board located in a junction box. The reed switch is routed directly to the weigh center and connected to the appropriate wires. The system is powered from a fused 12V power supply.

2.9.1 Disassembly of Indicator Panel

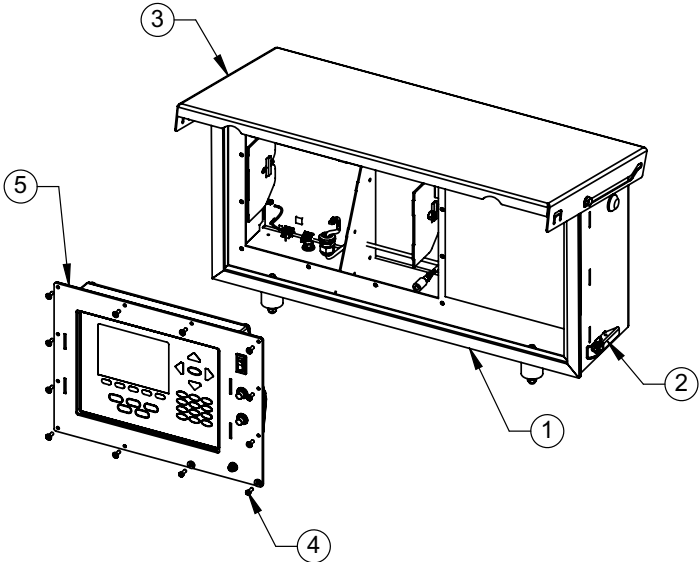


Figure 2-23. Removal of Indicator

To access the terminal switches for installation of Magnetic Alarm Switch or wiring homerun and power cable:



WARNING: Procedures requiring work inside the indicator must be performed by qualified service personnel only.

Before opening the unit, ensure the power is disconnected.

1. Release latches (2) on each side and raise the cover (3).
2. Remove the screws (4) holding the front panel to the weigh center box (1).
3. Remove the indicator assembly (5) from the weigh center.



NOTE: Reassemble by reversing the order above.

2.10 Conduit Connections

Follow for assembly of conduit connectors.



NOTE: Rice Lake Weighing Systems supplies 60 feet of conduit cable with each system. Additional cable can be purchased at time of order.

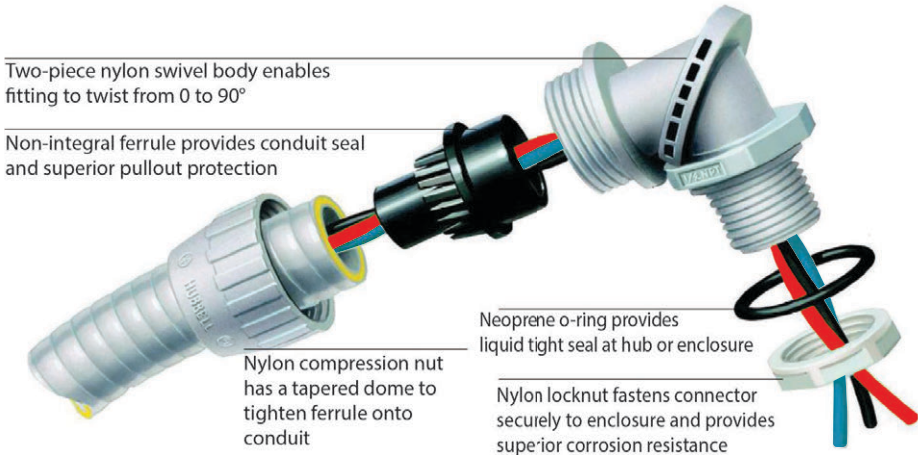


Figure 2-24. Non-Metallic Conduit Connectors

All load cell cables are run in the flexible conduit.

The power wire and reed switch (hardware alarm) should be covered with conduit to keep weigh center watertight.

2.10.1 Conduit Termination

To keep moisture and unwanted pests and debris from the cable, install a silicon sealant over the cable that is run inside the conduit.

2.10.2 Reed Switch (Hardware Alarm)

The TradeRoute system is equipped with a “weigh position” alarm system, consisting of a reed switch and a magnet, which operates when the 920i is off. When the 920i indicator is on, the system software automatically monitors the weight on the scale and alerts the operator if the scale is in the weigh position via the LED located on the weigh center. The reed switch and magnet are installed at the factory, but must be electrically connected at system installation. The reed switch and magnet are mounted on the double load cell module of a three-point system and on one of the modules in a four-point system.

1. Bring wire into the weigh center through the strain relief.
2. Install spade terminals onto the reed switch cable.
3. Connect the cable to terminal as shown in [Figure 4-1 on page 57](#).
4. Test the alarm by raising the scale. When the scale is in the weigh position the alarm is activated. Lowering the scale into the transport position should turn the alarm off.

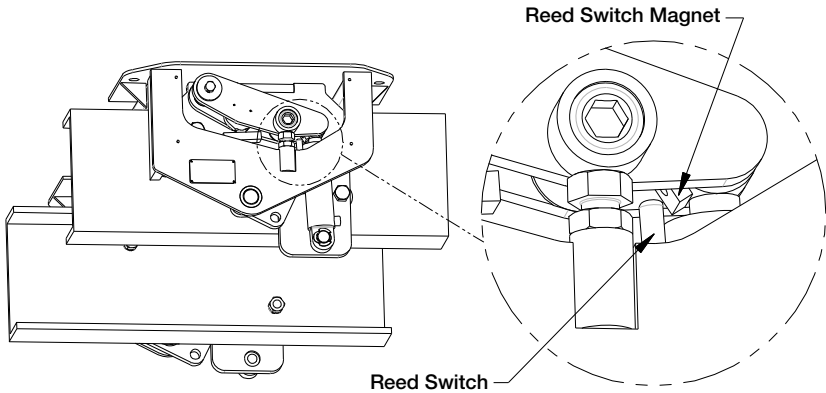


Figure 2-25. Reed Switch and Magnet Location

2.10.3 Power (Truck) Cable

Included with the electronic weigh center is a three-conductor 14-gauge cable that supplies power to the electronic weigh center. This cable is referred to as the truck cable. The truck cable has the following wiring color code:

BLACK – Negative

RED – Positive

GREEN – Chassis Ground

1. Route the power cable through the strain relief in the electronic weigh center to the nearest switched and fused connection. The weigh center power is connected to a switched circuit to ensure the weigh center is only on when the key is on.
2. Insert the 7.5A blade fuse into the blade fuse holder and connect one end of the blade fuse holder to the white conductor, using the included butt splice. Spade terminals are provided to create an insulated connection.
3. Connect other side of blade fuse holder to a power source or positive battery terminal.
4. Connect the black conductor to the negative battery terminal.
5. Attach **GREEN** wire to chassis ground.
6. Plug the power cable into the corresponding connector in the electronic weigh center. See [Figure 4-1 on page 57](#).
7. With the electronic weigh center switch OFF, turn the truck key on and confirm power by viewing the LED on the circuit board.
8. Turn off the power source.

2.11 Cell Covers

The final step in the mechanical installation is attachment of the load cell covers. Bolt the covers in position as shown in Figure 2-26 with 1/4" bolts and lock washers.

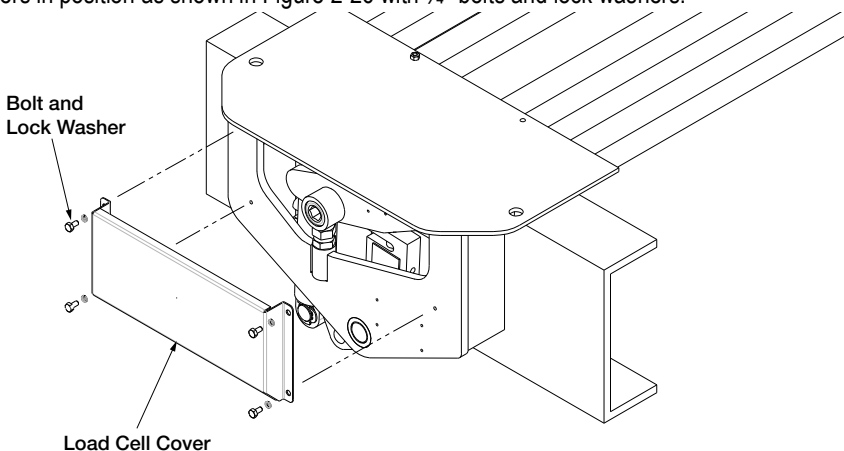


Figure 2-26. Load Cell Cover

2.12 Load Cell Numbering

Systems balanced at the factory

Systems that are balanced at the factory have load cell numbers already assigned. Connect numbered load cell wires to the corresponding connector on the circuit board.

Systems balanced at installation

Systems that have not been balanced at the factory, but are to be balanced at installation, should follow the load cell number convention shown below.

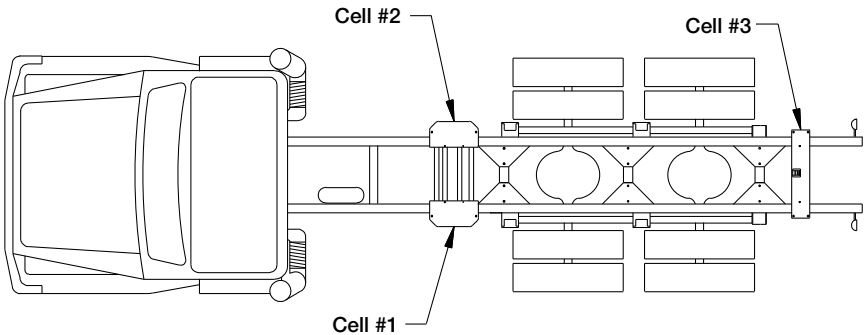


Figure 2-27. Load Cell Numbering for Three-Point System

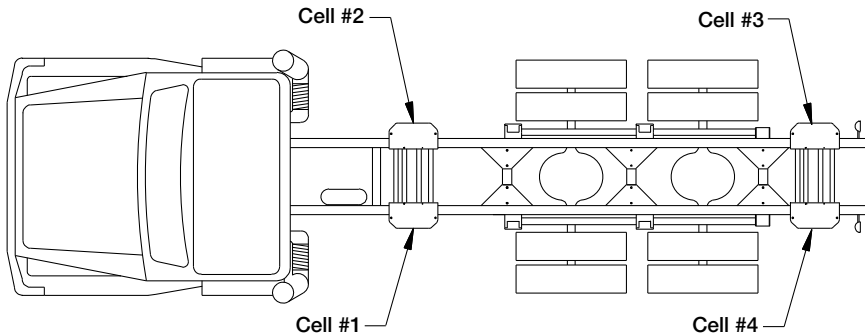


Figure 2-28. Load Cell Numbering for Four-Point System

2.12.1 Load Cell Connections

1. The load cell wires need to be routed from the modules to the indicator. The junction box must be mounted where it is easily accessible and in a location that protects it from the elements.
2. Measure lengths of conduit to pass the load cell wires through. The conduit must reach from near the load cell to the junction box. See Section 2.10 on page 34 for installation of the conduits connectors.
3. Feed load cell wires through conduit. The load cell wires must have a small amount of loose wire between the conduit and the load cell. The load cell wire must be loose to allow the scale to swing freely.
4. Wire load cell wires to the circuit board in the weigh center. Load cell wires may be cut to reduce the amount of wire looped inside the weigh center.



IMPORTANT: Load cell wires must not be cut closer than six feet away from the load cell (i.e. at least six feet of wire must be left attached to the load cell). The scale must be balanced and calibrated AFTER cutting load cell wires.

5. For each load cell, attach the load cell cable to the junction box according to Table 2-1. The wiring color code for the load cells is also shown.
6. The indicator connection must also be completed if using a junction box. Route conduit and scale cable from the junction box to the indicator.

2.12.2 Junction Box Connection

The indicator terminal strip is used to connect the main cable to the indicator which is shown in Figure 2-29. Determine the indicator's load cell input connections from the operating manual. Run a cable from your indicator terminal into the junction box and make the connections. The following table shows the correct junction box connections using the cable color code.

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

Table 2-1. Junction Box Connections

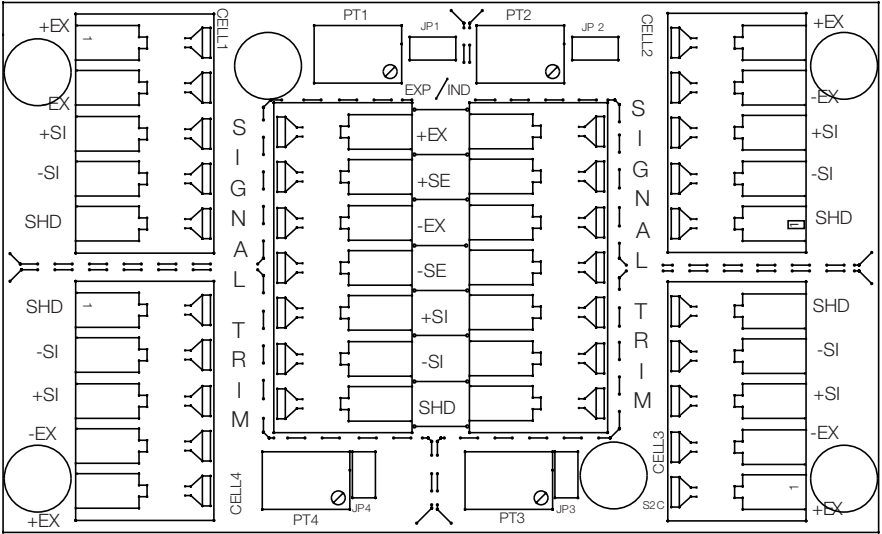


Figure 2-29. Junction Box Indicator Terminal

2.13 920i Indicator Junction Box Cable Installation

The homerun cable has been installed by the factory. If required, attach cable from a junction box to an installed A/D card, route the cable through the cord grip and ground the shield wire. Next, remove connector J1 from the A/D card. The connector plugs into a header on the A/D card (see Figure 2-30). Wire the load cell cable from the load cell or junction box to connector J1 as shown in Table 2-2.

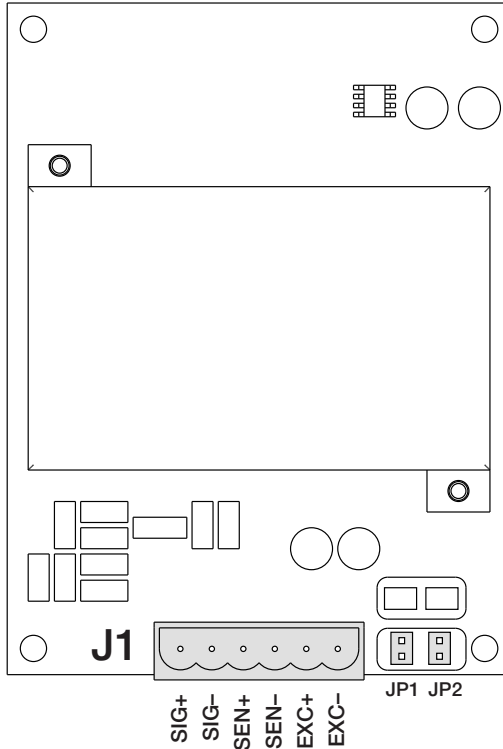


Figure 2-30. Single-Channel A/D Card

If using six-wire load cell cable (with sense wires), remove jumpers JP1 and JP2 before reinstalling connector J1. For four-wire installation, leave jumpers JP1 and JP2 on. For six-wire load cell connections on dual-channel A/D cards, remove jumpers JP3 and JP4 for connections to J2.

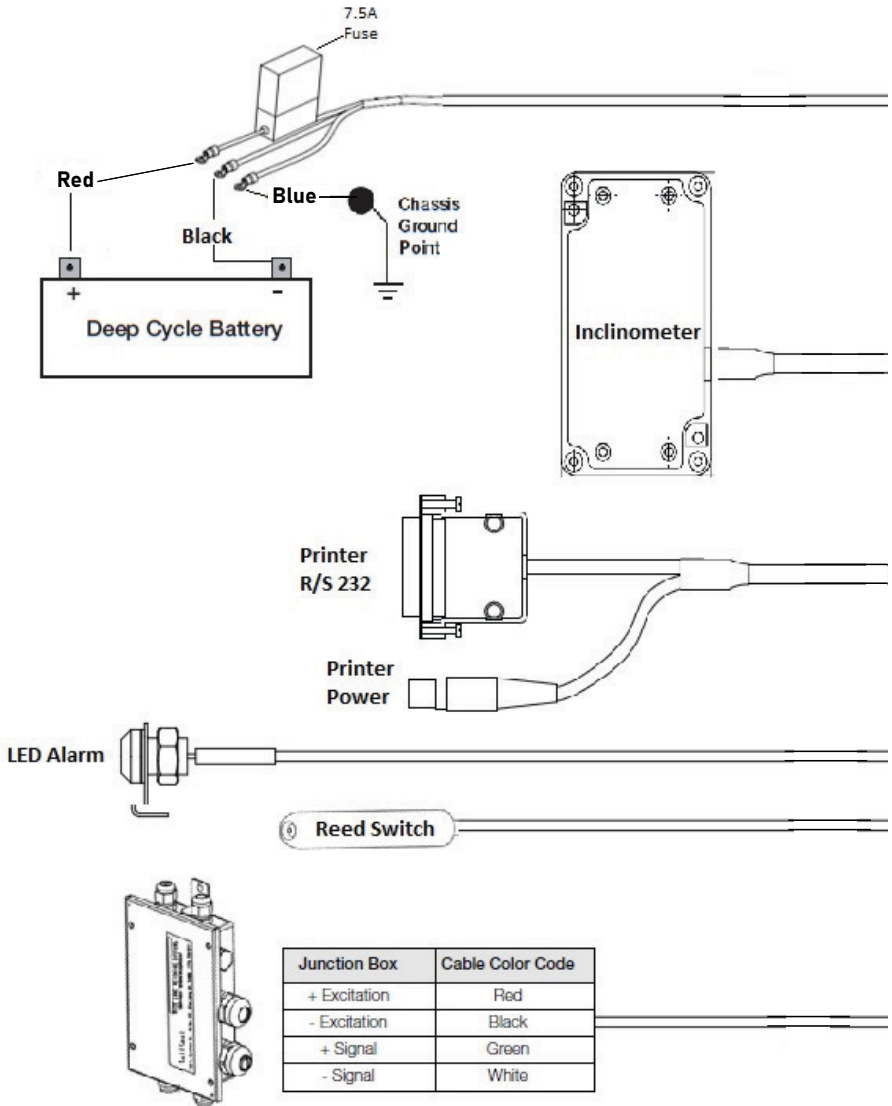
When connections are complete, reinstall load cell connector on the A/D card and use two cable ties to secure the load cell cable to the inside of the enclosure.

A/D Card Connector Pin	Function
1	+SIG
2	-SIG
3	+SENSE
4	-SENSE
5	+EXC
6	-EXC
<ul style="list-style-type: none"> •For six-wire load cell connections to connector J1, remove jumpers JP1 and JP2. •For six-wire load cell connections to connector J2 (dual A/D cards), remove jumpers JP3 and JP4. 	

Table 2-2. A/D Card Pin Assignments

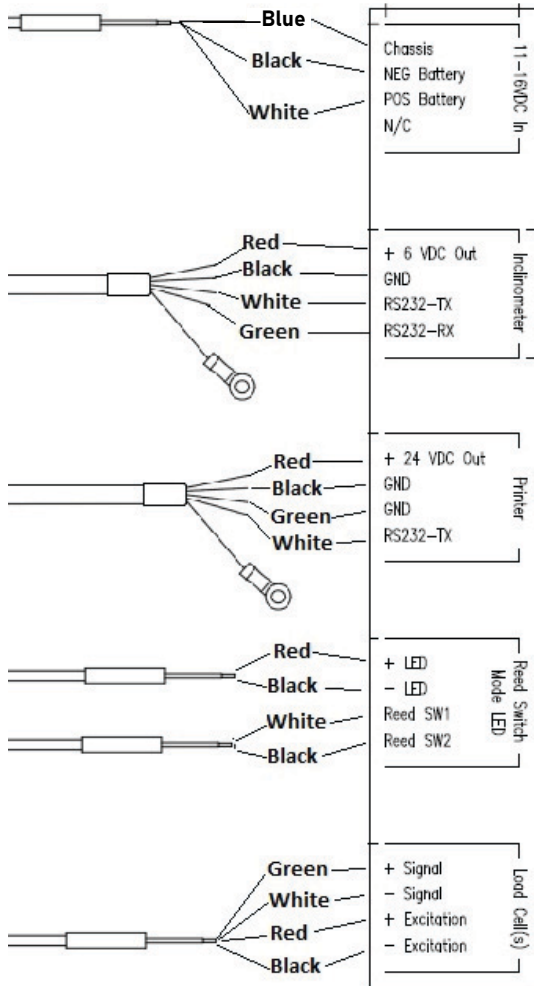
2.14 In-Cab 920i Indicator Wiring

Please review the following wiring diagram to properly connect to the peripherals supplied.



In-Cab Wiring

Figure 2-31. Custom 920i Indicator Wiring Diagram



Out-Cab Wiring

2.15 TradeRoute In-Cab Remote Inclinometer

Install the inclinometer in a vertical position on the truck frame (outside of the cab). Ensure a drip loop is added to prevent moisture from entering the enclosure.

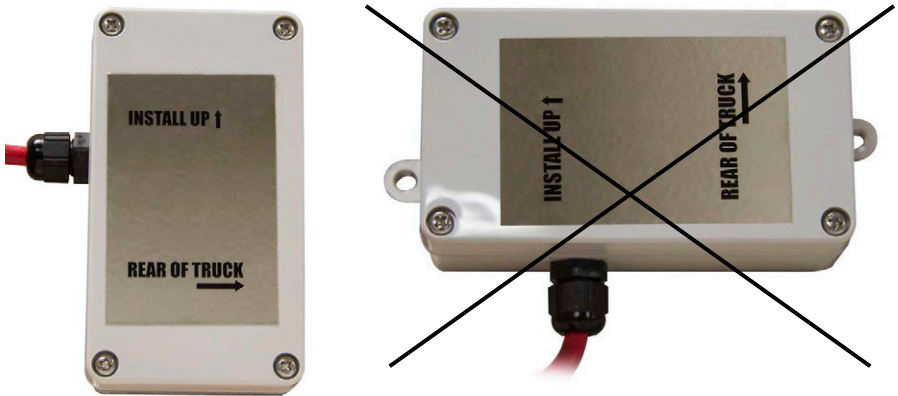


Figure 2-32. Install Inclinometer Vertically (not Horizontally)

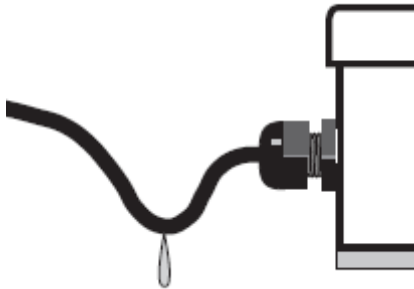


Figure 2-33. Drip Loop Application

3.0 920i® Electronic Weigh Center



IMPORTANT: Configuration and calibration should be performed only by a Rice Lake Weighing Systems distributor for Legal for Trade sealing.

3.1 FCC Statement



The 920i complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.
- Radio certificate number:
- US: R68WIPORTG
- Canada: 3867A-WIPORTG

3.2 Configuration

The 920i indicator (integral in the electronic weigh center) is set up with all required parameters when it is shipped with TradeRoute system. To interact with installed hardware the common parameters requiring configuration to all TradeRoute systems are shown in Table 3-3. The appropriate parameter values for popular net capacities are listed in Table 3-4 and Table 3-5. Double check that the parameters are set appropriately for the system.



NOTE: For a more detailed summary and instructions of configuration, see the 920i Installation Manual (PN 67887).

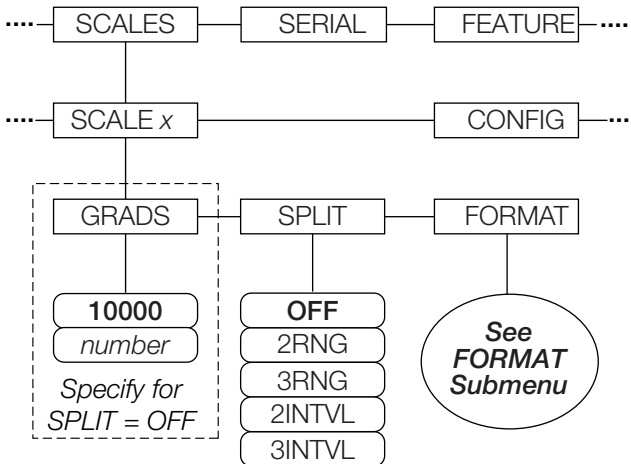


Figure 3-1. Scales Menu



NOTE: Configuration of the displayed capacity and resolution is required.

SCALES Menu		
Parameter	Choices	Description
Level 2 submenus		
SCALE _x		Allows configuration and calibration of each scale.
CONFIG		Lists available and associated A/Ds.
Level 3 submenus		
GRADS	10000 1-9999999	Specifies the number of full-scale graduations if SPLIT=OFF. (For multi-range and multi-interval scales [SPLIT ≠ OFF], the GRADS value is derived from the capacity and display divisions specified for the range or interval.) The value entered must be in the range 1-9999999 and should be consistent with legal requirements and environmental limits on system resolution. To calculate GRADS, use the formula: GRADS = Capacity / Display Divisions. Display divisions are specified under the FORMAT sub-menu.
SPLIT	OFF 2RNG 3RNG 2INTVL 3INTVL	Specifies whether the scale is full-range (OFF), multi-range (2RNG, 3RNG), or multi-interval (2INTVL, 3INTVL). See 920i Manual for further descriptions.
FORMAT	PRIMAR SECNDR	For standard scales (SPLIT=OFF), see sub-menu descriptions in Table 3-2. Also see 920i Manual (PN 67887) for further descriptions.

Table 3-1. Scales Menu

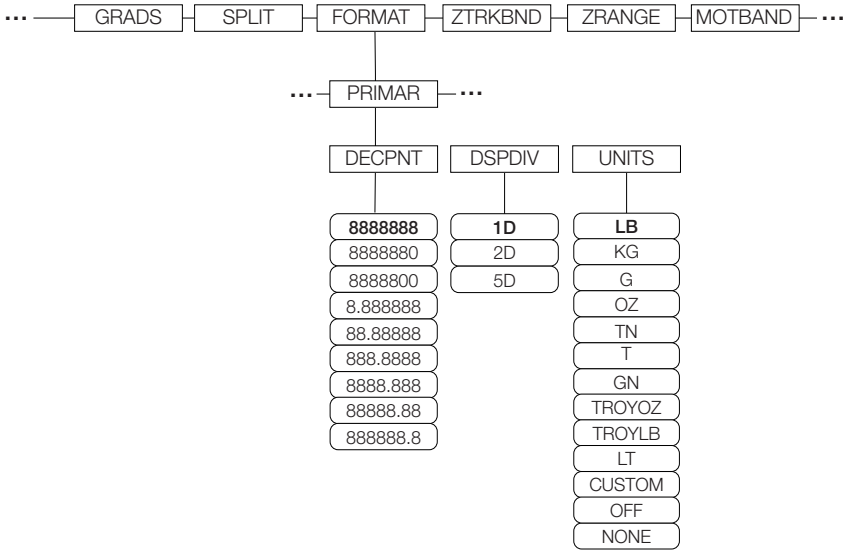


Figure 3-2. Format Menu

SCALES Menu, FORMAT Sub-menu, SPLIT = OFF		
Parameter	Choices	Description
PRIMAR	DECPNT DSPDIV UNITS	Specifies the decimal position, display divisions, and units used for the primary units. See Level 5 sub-menu parameter descriptions.
Primary Units (PRIMAR) Parameters		
DECPNT	8888888 8888880 8888800 8.888888 88.88888 888.8888 8888.888 88888.88 888888.8	Decimal point location. Specifies the location of the decimal point or dummy zeros in the primary unit display. Value should be consistent with local legal requirements.
DSPDIV	1D 2D 5D	Display divisions. Selects the minimum division size for the primary units displayed weight.

Table 3-2. Format Menu

SCALES Menu, FORMAT Sub-menu, SPLIT = OFF		
Parameter	Choices	Description
UNITS		Specifies primary units for displayed and printed weight.
	LB	pound
	KG	kilogram
	G	gram
	OZ	ounce
	TN	short ton
	T	metric ton
	GN	grain
	TROYOZ	troy ounce
	TROYLB	troy pound
	LT	long ton
	CUSTOM	
	NONE	
	OFF	

Table 3-2. Format Menu

3.3 Zero the Inclinometer



The inclinometer has been zeroed at the factory on a level surface. Once the electronic weigh center has been installed, perform this function with the system display level.

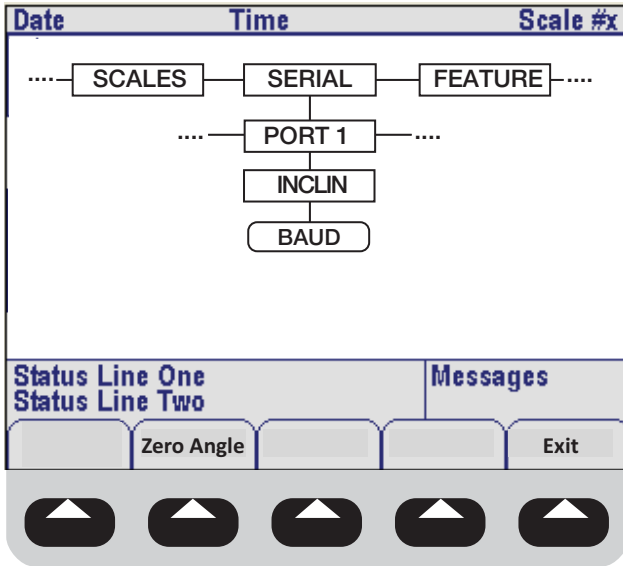





Figure 3-3. Inclinometer Settings

Adjust the scale platform for level in both pitch and roll using a bubble or electronic level.

1. Put the indicator in configuration mode.
2. Navigate over to SERIAL, then down to PORT 1.
3. Navigate down to ICLIN.
4. Navigate down to BAUD.
5. Press . There will be no indication the command was accomplished; check the angle indications to verify.
6. Press  to return to normal weigh mode.
7. Once in normal weigh mode, press . The pitch and roll values will be displayed. Due to heavy filtering it may take several seconds for the angle values to settle.

3.4 Balancing Procedure and Corner Correction

When loading test weights on the scale (for balancing or calibration), it is important to position the weights correctly. Imagine lines connecting the load cell positions (see Figure 3-4). Keep the weights inside the area defined by the lines connecting the load cell positions.



NOTE: Temporary racks may be required on the container to place the weights on during testing. All modules have provisions for hanging test weights below the truck frame.

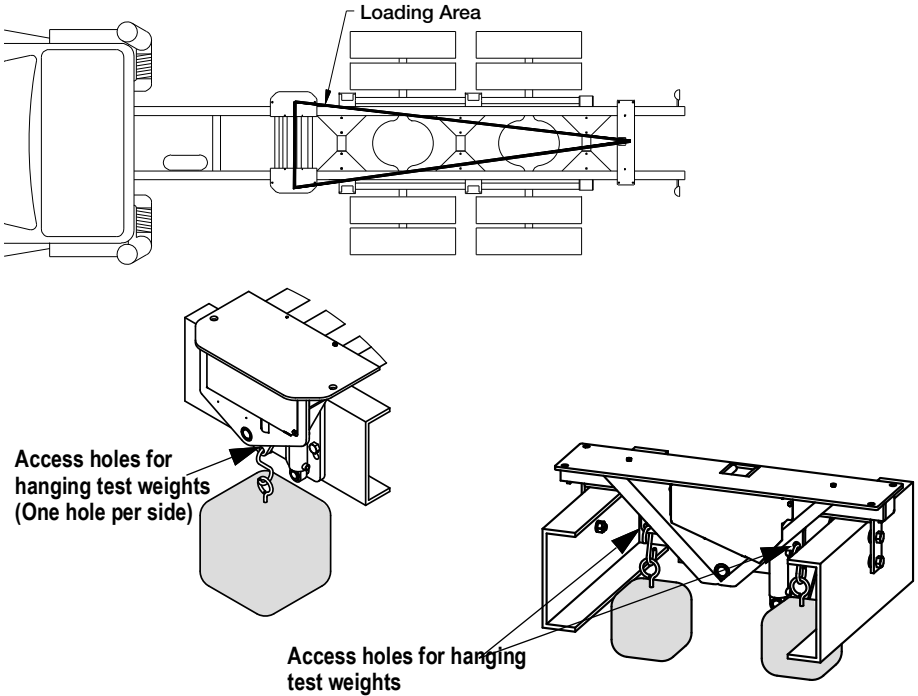


Figure 3-4. Loading Area Double Assembly (left) and Single Assembly (right)

Before the scale can be calibrated, all load cells must be balanced and responding to loading equally by adjusting the balance trimmers. The balance trimmers are located on the junction box (see [Figure 3-5](#)). Use the following procedure to balance the load cells.

1. All assembled scales are delivered with the junction box corner-trimmed to verify load cell operation only. 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.
 - a. 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 [Section 2.12 on page 37](#) for scale deck corner numbering.
 - b. The indicator must be connected and calibrated approximately, but it need not indicate the exact weight value. A test weight will be required. The recommended test weight for all <H65>Trade<H469>Route models is 25% of scale capacity.
2. Ensure the load cells are all loose when in the transport mode. The lock-down bolts may have to be adjusted if the load cell is binding. Raise and lower the scale several times to ensure the scale is hanging freely.
3. Raise the scale. Dead load the test rack by following the calibration procedure in [Section 3.2](#). Load weights on the rack to the full capacity of the scale and then unload all the weights. This process exercises the load cells.
4. Press the zero key to obtain a good center of zero. Load one load cell by placing the balancing weights on that corner of the tank (inside the triangle noted above). Keep the weights as close to the load cell as possible directly above the load cell being calibrated. Record the weight on the 920i. The weight reading should be close to the actual weight applied at this point in the procedure; however, it does not need to be exact.
5. Repeat step four for the other load cells with the same procedure (remembering to press the zero key to obtain a good center of zero). All the readings should be within approximately 1 percent of each other. If the readings are significantly farther apart, you may not be able to balance your system. Contact Rice Lake Weighing Systems for technical assistance.
6. Pick the lowest reading and adjust the other load cells down to this value with the trimmers inside the j-box.
7. With no weight on the scale, zero the indicator. Then turn all four potentiometers (shown in [Figure 3-5](#)) to increase the reading until a clicking sound is heard from each potentiometer. This ensures the maximum signal from each load cell.

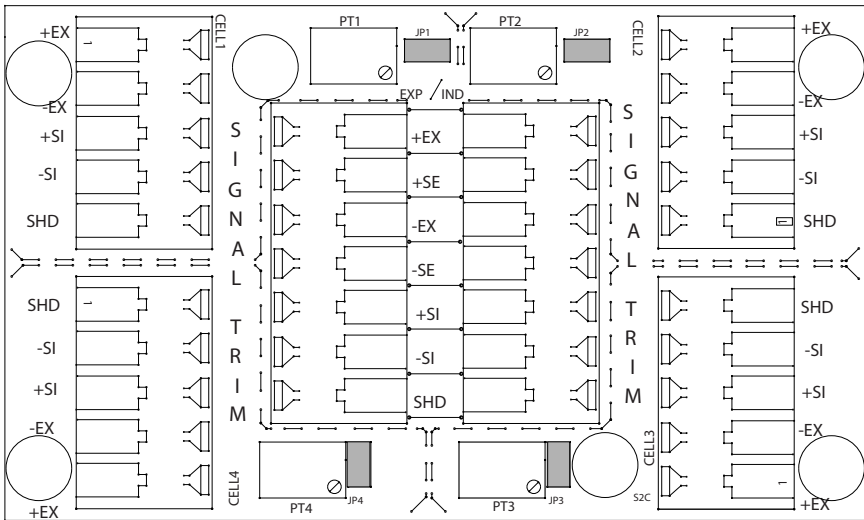


Figure 3-5. Trim Potentiometers

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 will be used as a reference point and will not be trimmed.

8. Test the final balance by loading each load cell again and recording the 920i readings. The load cells must read within one graduation of each other for an acceptable final balance. However, it is more desirable that there be no difference in the readings (zero balance error).
9. The system can now be calibrated.

EXAMPLE: OB30L-F3 System

Balancing Weights

English = 5000 lb Metric = 2000 kg

Graduations

English = 5 lbMetric = 2 kg

English Units (lb)			Load Cell	Metric Units (kg)		
920i Reading				920i Reading		
Start	Loaded	Unloaded		Start	Loaded	Unloaded
0	4995	0	1	0	1998	0
0	4990	0	2	0	1996	0
0	5005	0	3	0	2002	0

Table 3-3. First Loading

The results in Table 3-3, show that load cells one and three must be adjusted down to read 4990 lb (1996 kg in the metric example). First, the potentiometer for load cell one is turned to bring the reading down (step 6).

English Units (lb)			Load Cell	Metric Units (kg)		
920i Reading				920i Reading		
Start	Loaded	Unloaded		Start	Loaded	Unloaded
0	4990	0	1	0	1996	0
			2			
			3			

Table 3-4. Second Loading

Next, the potentiometer for load cell three is turned to bring its reading down to 4985 lb (1994 kg in the metric example) and check for a zero shift.

English Units (lb)			Load Cell	Metric Units (kg)		
920i Reading				920i Reading		
Start	Loaded	Unloaded		Start	Loaded	Unloaded
			1			
			2			
0	4985	-5	3	0	1994	-2

Table 3-5. Third Loading

The unloaded reading is found to be -5 lb (-2 kg), indicating a zero shift. The scale must therefore be rezeroed, and load cell three checked again.

English Units (lb)			Load Cell	Metric Units (kg)		
920i Reading				920i Reading		
Start	Loaded	Unloaded		Start	Loaded	Unloaded
0	4990	0	1	0	1996	0
0	4990	0	2	0	1996	0
0	4990	0	3	0	1996	0

Table 3-6. Fourth Loading

The load cells are now balanced within the tolerance of one graduation.

3.5 Calibration

The CALIBR sub-menu (under the SCALES menu, see [Figure 3-6](#)) is used to calibrate the 920i. The zero, span, and linear calibration point displays provide a set of softkeys used specifically for calibration procedures:

+/-Toggles to allow entry of negative or positive values.

Last ZeroRecalls the last established zero value to allow calibration without removing tests weights or product from scale.

CalibratePerforms calibration for the selected point.

Temp ZeroTemporarily zeros the displayed weight of a non-empty scale. After span calibration, the difference between the temp zero and the previously calibrated zero value is used as an offset.

Millivolts (or Counts)

Toggles between display of captured A/D counts and captured millivolts values; allows entry of calibration values in mV or counts.

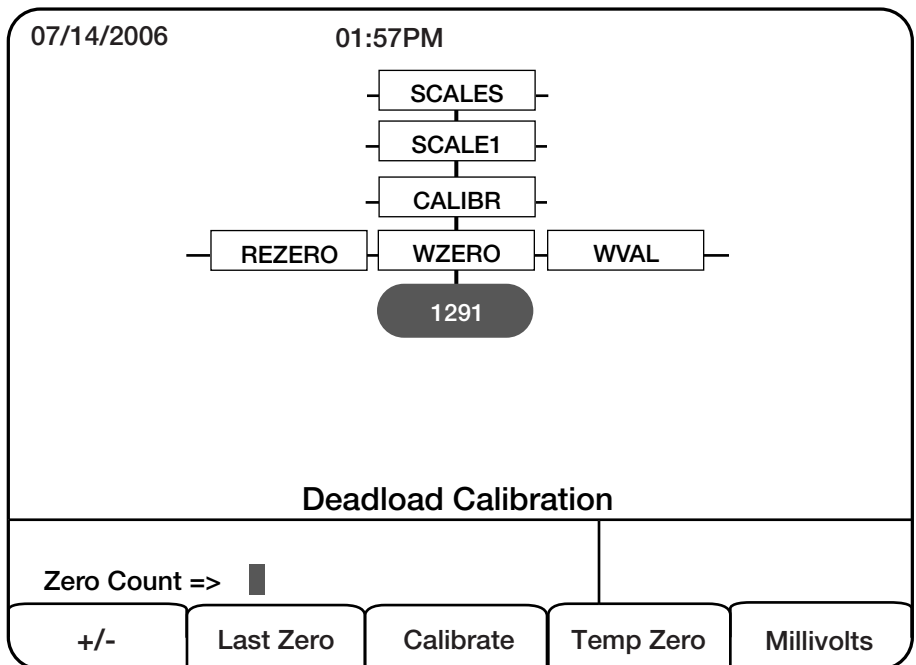











Figure 3-6. WZERO Calibration Display

To calibrate the indicator using the front panel:

1. Place the indicator in setup mode (display reads Scale Configuration) and remove all weight from the scale platform. If your test weights require hooks or chains, place the hooks or chains on the scale for zero calibration.
2. With the SCALES menu highlighted, press  and select the scale to be calibrated.
3. Press  again (GRADS parameter highlighted).
4. Press left to highlight the CALIBR sub-menu.
5. Press  to go to zero calibration (WZERO). See [Figure 3-6](#).
6. Ensure scale is empty and press  again to show the current WZERO value.
7. Press the Calibrate softkey to calibrate zero. When complete, the new A/D count for the zero calibration is displayed.
8. Press  to save the zero calibration value and go to the next prompt (WVAL).
9. With WVAL displayed, press  to show the stored calibration weight value.
10. Use the numeric keypad to enter the actual value of the calibration test weights and press  to save the value and go to span calibration (WSPAN).
11. Place test weights on scale.
12. Press  again to show the current WSPAN value.
13. Press the Calibrate softkey to calibrate span. When complete, the new A/D count for the span calibration is displayed.
14. Press  again to save the span calibration value and go to the next prompt (WLIN).




Five-Point Linearization (Using the WLIN Parameter)




This provides increased scale accuracy by calibrating the indicator at up to five additional points between the zero and span calibrations.



NOTE: Linearization is optional: if you choose not to perform linearization, skip the WLIN parameter; if linearization values have previously been entered, these values are reset to zero during calibration. WZERO and WSPAN must be calibrated before adding linearization points; WLIN values must be less than the WSPAN value and must not duplicate WZERO or WSPAN.

To perform linearization, follow the procedure below:

1. With WLIN displayed, press down to go to the first linearization point (POINT 1).
2. Press  again to show the weight value prompt (WGT 1).
3. Press  once more to show the weight value.
4. Place test weights on the scale; use the numeric keypad to enter the actual test weight value.
5. Press  to save the value and move to the calibration (CAL 1) prompt.





6. Press  to show the current calibration value.
7. Press the Calibrate softkey to calibrate the linearization point. When complete, the A/D count for the linear calibration is displayed.
8. Press  again to save the calibration value and go to the next prompt (POINT 2).
9. Repeat for up to five linearization points.
10. To exit the linearization parameters, press  to return to WLIN.

Re-zero Function


The optional re-zero function is used to remove a calibration offset when hooks or chains are used to hang the test weights.



NOTE: *The re-zero function cannot be used with five-point linear calibration.*

- If no other apparatus was used to hang the test weights during calibration, remove the test weights and press  to return to the CALIBR sub-menu.
- If hooks or chains were used during calibration, remove these and the test weights from the scale. With all weight removed, go to the REZERO parameter and press  to show the current zero value. Press the Calibrate softkey to adjust the zero and span calibration values. Press  or  to return to the CALIBR sub-menu.



NOTE: Press  to return to the SCALES menu, or press the Save and Exit softkey to exit setup mode.

4.0 Repair Parts

4.1 Double Cell Assembly

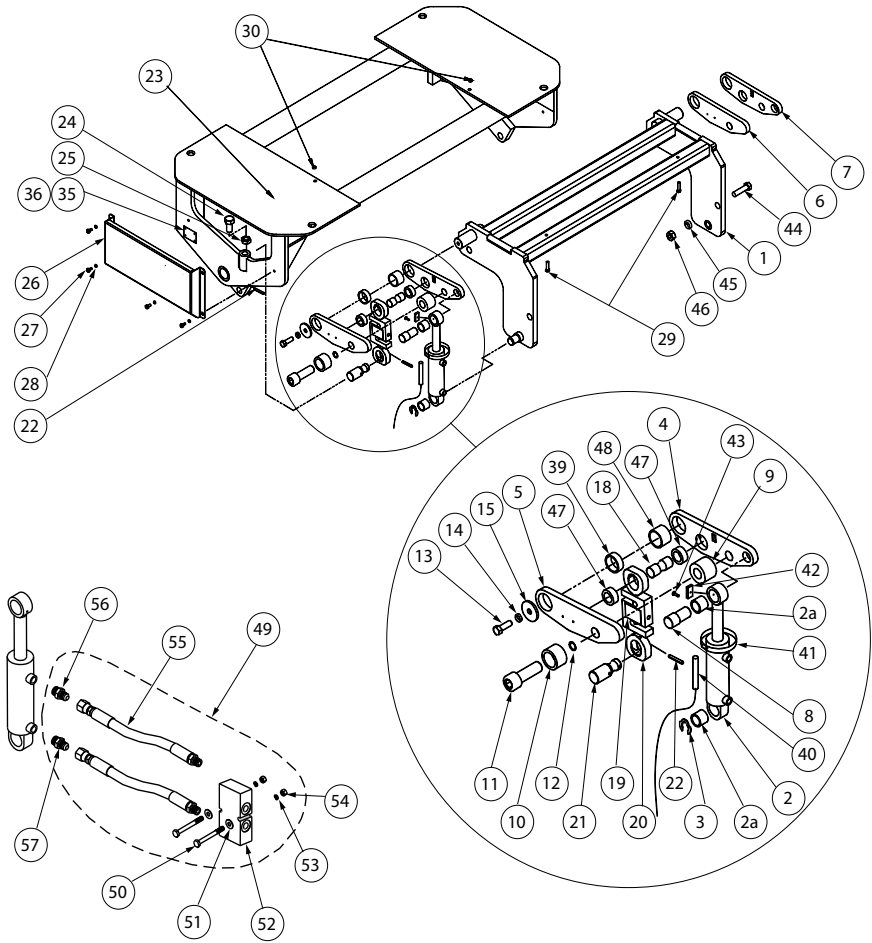


Figure 4-1. Double Cell Assembly Parts Illustration

Item	Part No.	Description	Qty
1	128592	Base Assy, Double Low	1
2	127183	Cylinder, Hydraulic 1.75 x 3.75	2
2a	126801	Bushing, Oil Lite 1 1/4 x 1 x 1	4
3	126942	Ring, Retaining External	2
4	127648	Lift Arm assy, Low Profile (Inc Items 47 & 48)	1
5	127649	Lift Arm Assy, Low Profile (Inc Items 39 & 47)	1
6	127650	Lift Arm Assy, Low Profile (Inc Items 47 & 48)	1
7	127651	Lift Arm Assy, Low Profile	1
8	127653	Pin, Upper Cylinder Low	2
9	127652	Spacer, Lift Arm Low	2
10	127662	Sleeve, Lift Arm Lockdown	2
11	127667	Screw Cap, 1-14 UNS x 3 Hex	2
12	126800	O-Ring, 1 IN ID X 1-1/8 IN	2
13	14751	Bolt, 1/2-13 NC x1 Hex Head	2
14	15167	Washer, Lock 1/2 Regular	2
15	127663	Washer, Pivot Pin Low	2
18	127655	Pin, Upper Load Cell 15K	2
	127654	Pin, Upper Load Cell 10K	2
19	128641	LC with Eye Bolts 15K	4
	21412	Load Cell, SBM RL20001-T10 - 15K	2
	127643	Eye Bolt, Machined 15K	4
19	127673	LC with Eye Bolts 10K MAS	4
	21444	Load Cell, SBM RL20000B - 10K	2
	127163	Eye Bolt, Machine 10K MAS	4
19	128674	LC with Eye Bolts	4
	21443	Load Cell, SBM RL20000B-5K	2
	127163	Eye Bolt, Machine 10K MAS	4
21	127657	Pin, Lower Load Cell 15K	2
	127656	Pin, Lower Load Cell 10K	2
22	126926	Pin, 1/4 x 2-1/4 Slotted 15K	4
	126965	Pin, 1/4 x 1-3/4 Slotted 10K MAS	4

Item	Part No.	Description	Qty
23	128609	Lift Plate, Double 15K	1
	128603	Lift Plate, Double 10K Low	1
24	126999	Screw, Cap 3/4-10 x 2 Hex	2
25	14686	Nut, Jam 3/4-10 NC Hex	2
26	127664	Cell Cover Assy, Double	2
27	127007	Screw, Cap 1/4-20 x 1/2	8
28	15147	Washer, Lock 1/4 Regular	8
29	126925	Screw, Cap 1/4-20 x 2-3/4	2
30	14641	Nut, 1/4-20NC Hex Steel	2
35	16863	Label, Scale/Base	1
36	14905	Screw, Drive NO 4 x 3/8	2
39	126799	Bushing, Oil Lite 1.75" x 1.5" x 0.75"	1
40	127638	Sensor Assy, OBS Alarm	1
41	126840	Hose Clamp, No. 36 Band	1
42	127637	Magnet, ODW Reed Switch	1
43	126980	Screw, Machine 10-32 x 1/2	1
44	126998	Screw, Cap 3/4-10 x 2-1/2	4
45	15181	Washer, Lock 3/4 Regular	4
46	126994	Nut, Hex 3/4-10 Grade 8	4
47	126804	Bushing, Oil Lite 1.5" x 1.25" x 0.5"	4
48	126802	Bushing, Oil Lite 1.75" x 1.5" x 2"	1
49	127603	Hardware Kit, Hydraulic (Inc Items 50-57)	2
50	127031	Screw, Cap 1/4-20 x 2-1/4	2
51	81427	Washer, Flat 1/4 Steel	2
52	127083	Valve, Hydraulic Line Lock	1
53	15147	Washer, Lock 1/4 Regular	2
54	14641	Nut, 1/4-20NC Hex Steel	2
55	127607	Hose Assy, Hydraulic Line	2
56	128242	Coupling, Hydraulic 6MB	1
57	128286	Coupling, Hydraulic 1/32	1
	127015	Cable Tie, 7.5 inch Black	4

4.2 Single Cell Assembly

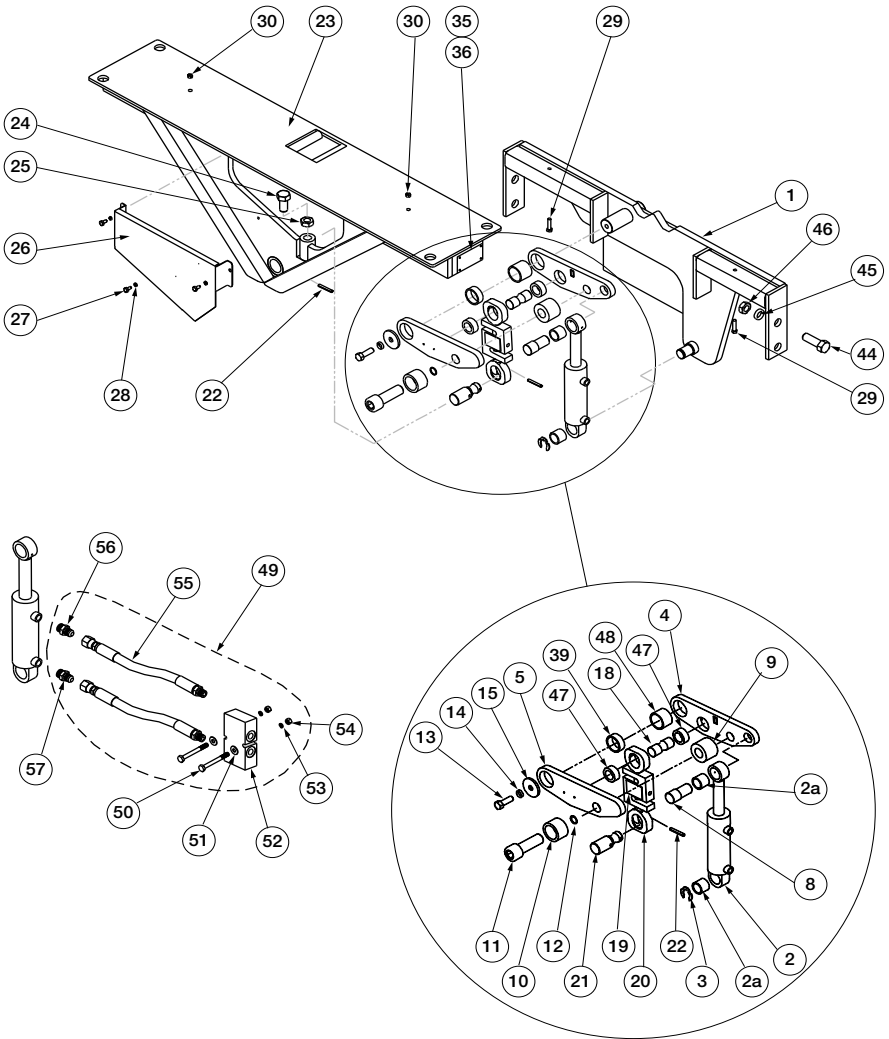


Figure 4-2. Single Cell Assembly Parts Illustration

Item	Part No.	Description	Qty
1	128659	Base Single Low Profile	1
2	127183	Cylinder, Hydraulic 1.75 x 3.75	2
2a	126801	Bushing, Oil Lite 1 1/4 x 1 x 1	4
3	126942	Ring, Retaining External	2
4	127648	Lift Arm Assy, Low Profile	1
5	127649	Lift Arm Assy, Low Profile	1
8	127653	Pin, Upper Cylinder Low	2
9	127652	Spacer, Lift Arm Low	2
10	127662	Sleeve, Lift Arm Lockdown	2
11	127667	Screw Cap, 1-14 UNS x 3 Hex	2
12	126800	O-Ring, 1 IN ID X 1-1/8 IN	2
13	14751	Bolt, 1/2-13 NC x 1 Hex Head	2
14	15167	Washer, Lock 1/2 Regular	2
15	127663	Washer, Pivot Pin Low	2
18	127655	Pin, Upper Load Cell 15K	2
	127654	Pin, Upper Load Cell 10K	2
19		LC with Eye Bolts 15K	2
	128969	Load Cell, S-Type 15K OIML	1
	127643	Eye Bolt, Machined 15K	2
19		LC with Eye Bolts 10K MAS	2
	21444	Load Cell, SBM RL20000B - 10K	1
	127163	Eye Bolt, Machine 10K MAS	2
19		LC with Eye Bolts	2
	21443	Load Cell, SBM RL20000B-5K	1
	127163	Eye Bolt, Machine 10K MAS	2
21	127657	Pin, Lower Load Cell 15K	1
	127656	Pin, Lower Load Cell 10K	1
22	126926	Pin, 1/4 x 2-1/4 Slotted 15K	2
	126965	Pin, 1/4 x 1-3/4 Slotted 10K MAS	2
23	128858	Lift Plate, Single 15K Low	1
	128660	Lift Plate, Single 10K Low	1
24	126999	Screw, Cap 3/4-10 x 2 Hex	1
25	14686	Nut, Jam 3/4-10 NC Hex	1
26	128661	Cell Cover, Single	1

Item	Part No.	Description	Qty
27	127007	Screw, Cap 1/4-20 x 1/2	3
28	15147	Washer, Lock 1/4 Regular	3
29	126925	Screw, Cap 1/4-20 x 2-3/4	2
30	126993	Nut, 5/16-18NC Hex Steel	2
35	127066	Label, Scale/Base (OB10 & OB15)	1
	127067	Label, Serial Plate (OB5)	1
36	128136	Rivet, Blind Pop 1/8 Ø	4
39	126799	Bushing, Oil Lite 1.75" x 1.5" x 0.75"	1
40	127638	Sensor Assy, OBS Alarm	1
41	126840	Hose Clamp, No. 36 Band	1
42	127637	Magnet, OBW Reed Switch	1
43	126980	Screw, Machine 10-32 x 1/2	1
44	126998	Screw, Cap 3/4-10 x 2-1/2	4
45	15181	Washer, Lock 3/4 Regular	4
46	126994	Nut, Hex 3/4-10 Grade 8	4
47	126804	Bushing, Oil Lite 1.5" x 1.25" x 0.5"	4
48	126802	Bushing, Oil Lite 1.75" x 1.5" x 2"	1
49	127603	Hardware Kit, Hydraulic	2
50	127031	Screw, Cap 1/4-20 x 2-1/4	2
51	81427	Washer, Flat 1/4 Steel	2
52	127083	Valve, Hydraulic Line Lock	1
53	15147	Washer, Lock 1/4 Regular	2
54	14641	Nut, 1/4-20NC Hex Steel	2
55	127607	Hose Assy, Hydraulic Line	2
56	128242	Coupling, Hydraulic 6MB	1
57	128286	Coupling, Hydraulic 1/32	1
	127638	Sensor Assy, OBS Magnetic Alarm	1
	127015	Cable Tie, 7.5 inch Black	4

4.3 Electronic Weigh Center Repair Parts

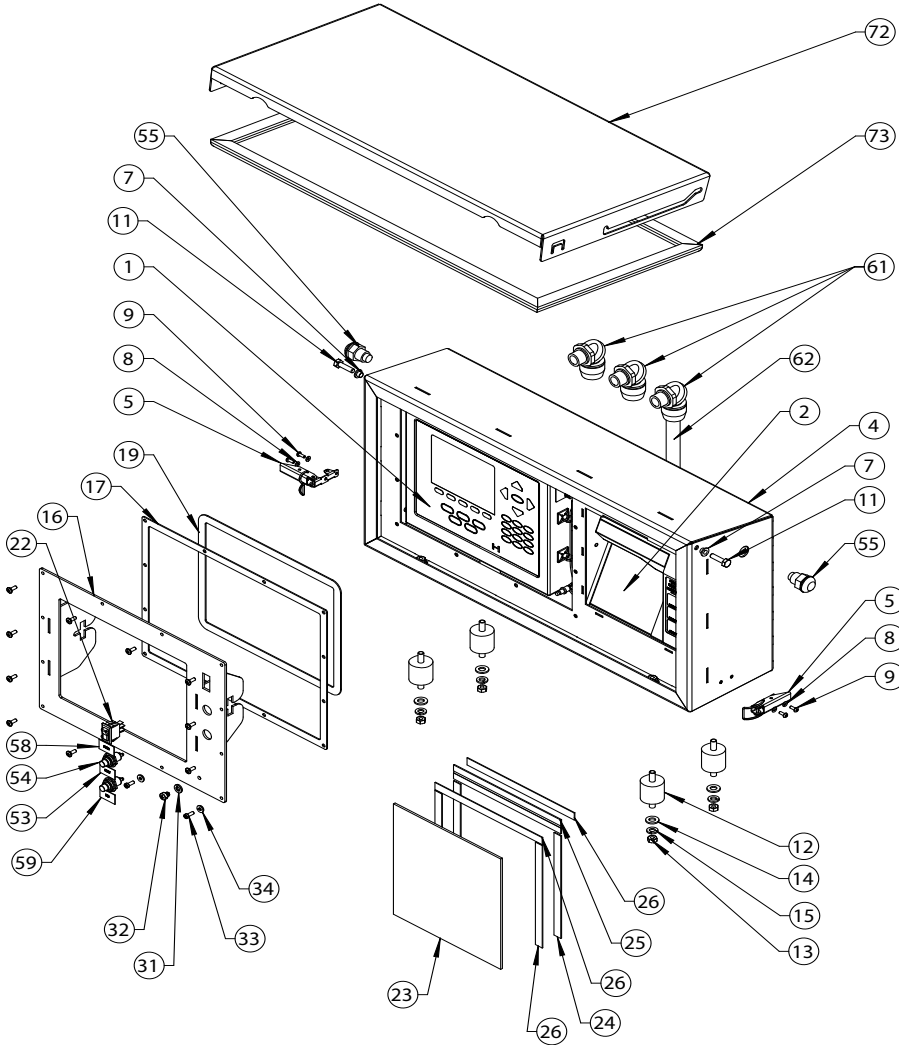


Figure 4-3. Electronic Weigh Center Replacement Parts Illustration



NOTE: See Figure 4-4. for assembly parts used with the indicator and printer.

No.	Part No.	Description	Qty.
1	131662	Indicator, 920i Plus, Univ	1
4	131714	OBW Enclosure, Weigh Center	1
5	127289	Latch, Toggle SS 802	1
7	131454	Shoulder Washer, Nylon	2
8	15129	Washer #6 Nylon Flat	4
9	14848	Screw, Machine, 6-32 NC x 3/8 Phillips Pan Head 18-8SST	4
11	128753	Screw, Cap 1/4-20 x 1 Hex	2
12	131458	Anti-Vibration Mount	4
13	126993	Nut Hex NC GR5 Pltd 1/4	8
14	111843	Washer, Plain 5/16 Type A Series N Steel Galvanized	8
15	15153	Washer, Lock 5/16 Regular Helical	8
16	131712	OBW Front Bezel, Indicator	1
17	131448	Gasket, Bezel/Front Plate	1
19	131447	Gasket, Indicator/Front Plate	1
22	128774	Switch, Rocker ON - None	1
23	131441	Printer Splash Shield	1
24	127108	Magnet, 1/2 in x .06 Thick	2
25	127288	Hinge Plastic Continuous	1
26	127072	Foam, 1/2 inch Adhesive	2
31	44676	Washer, Bonded, Sealing	1
32	42640	Screw, Mach 1/4-28 NF x 1/4 Phillips Drilled Filister Head	1
33	30623	8-32 Drilled Filister Head Screw	2
34	45042	Washer #8 SST/Rubber	2
40	132490	Power Cable	1
53	114695	Legend Plate, Start	1
54	127257	Switch, Push Button Sealed	2
55	128223	LED, Panel Mount Red	2
58	132469	Legend Plate, Power	1
59	132470	Legend Plate, End	1
61	127135	Conn, Non Metallic Liquid	3
62	132490	Power Cable	1
72	131933	Door, Enclosure OBW	1
73	131443	Gasket, Cover	1

Table 4-1. Electronic Weigh Center Replacement Parts List

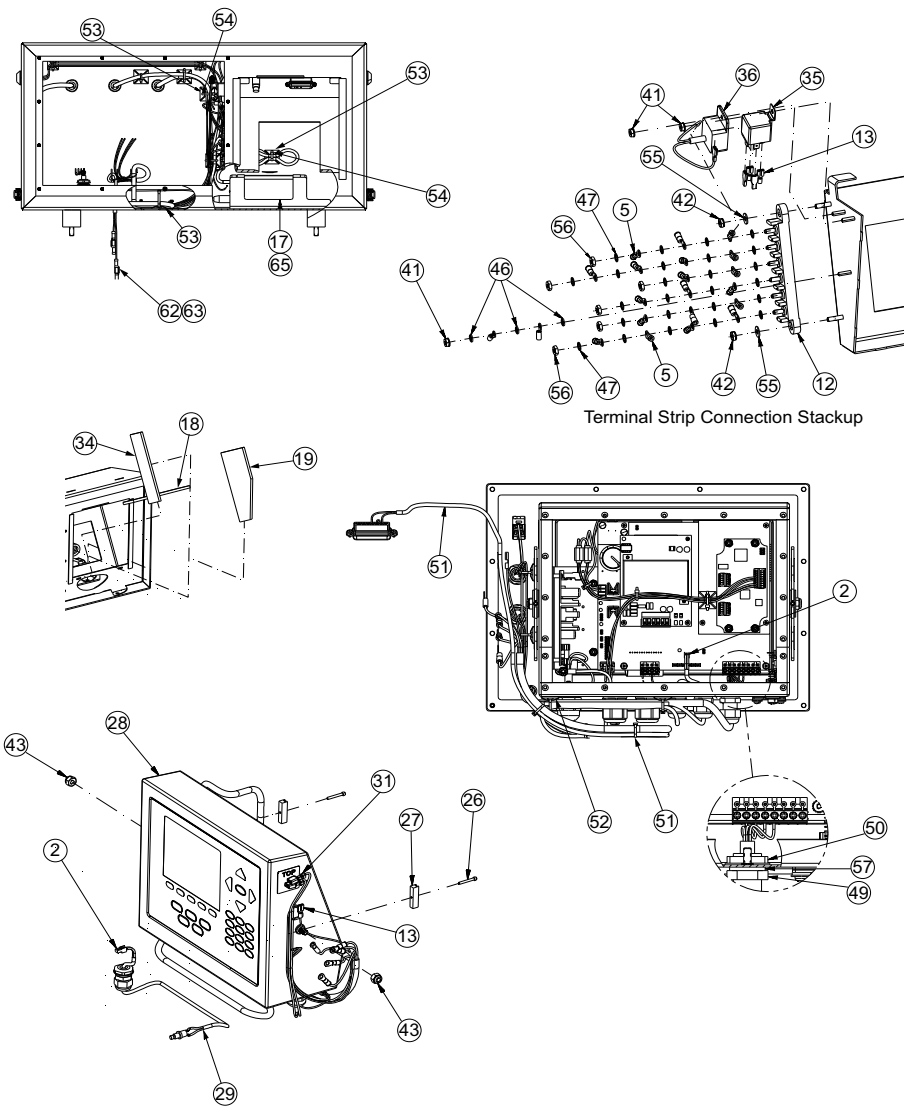


Figure 4-4. Indicator and Printer Assembly Parts Illustration

No.	Part No.	Description	Qty.
2	114695	Legend Plate, Start	1
3	126938	Screw, Machine 8-32 x 7/16	10
5	127038	Terminal Ring, Insulated	13
12	127402	Terminal Block, 6 Steel	1
13	128102	Terminal, 1/4 in Female	5
17	131437	Clamp, Power Supply	1
18	131439	Foam Insert, Front	1
19	131440	Foam Insert, Side	1
26	131459	Screw, Cap 4-40 X 7/8 SHCS	2
27	131461	Mount Clamp	2
29	131667	Calibration Switch Assembly	1
30	131668	Printer Cable Assembly	1
31	131673	Power Switch Cable	2
34	131758	Foam Insert, LH Side	1
35	131881	12 VDC Automotive Relay Mini ISO	1
36	131882	12 VDC Automotive Flasher	1
41	14626	Nut, Kep 8-32 NC Hex	3
42	14632	Kep Nut #10-32 NF	2
43	14635	Nut, Lock 1/4-20 NC, Hex Nylon Insert, Steel Zinc Plated	4
46	15134	Internal Tooth No.8 Lock Washer	3
47	15140	Washer, Lock No 10 Type A	25
49	15626	Cord Grip Dup	1
50	15627	PG9 Lock Nut	1
51	15631	Cable Tie, 3 in Nylon	4
52	15650	Mount, Cable Tie 3/4 in Square Nylon	9
53	15658	Mount, Cable Tie	10
54	127257	Switch, Push Button for R26 and ST2-25	2
55	22062	No. 10 Washer Type A Plain	2
56	22065	No. 10 -20 Hex Nut	6
57	30375	Nylon Washer Dup	1
62	54765	Female Terminal Connector, 1/4 x .032 22-18 AWG	2
63	57551	Male Terminal Connector, 1/4 x .032 22-18 AWG	2
64	65635	Epson TW 295 Ticket Printer	1

Table 4-2. Indicator and Printer Assembly Parts List

65	72309	Power Supply, Auto Plug 12 VDC	1
NS	99191	Decal	1

Table 4-2. Indicator and Printer Assembly Parts List

4.3.1 Electronic Weigh Center Wiring Diagram

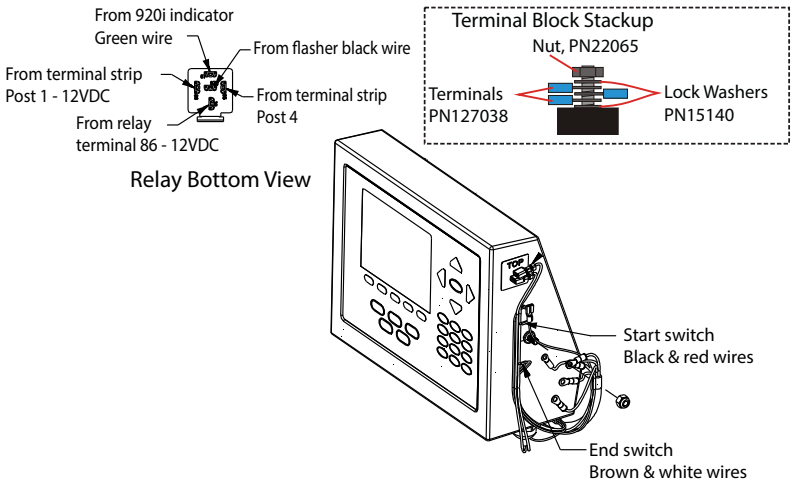
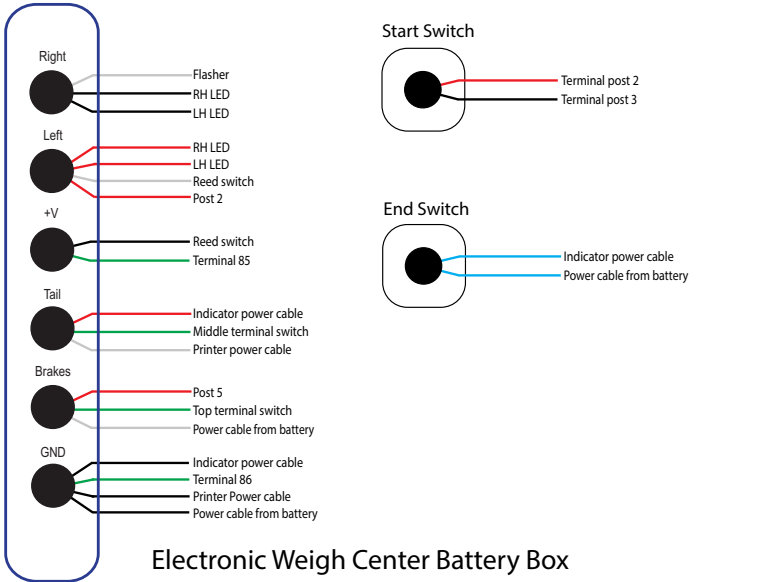


Figure 4-5. Electronic Weigh Center Wiring Diagram

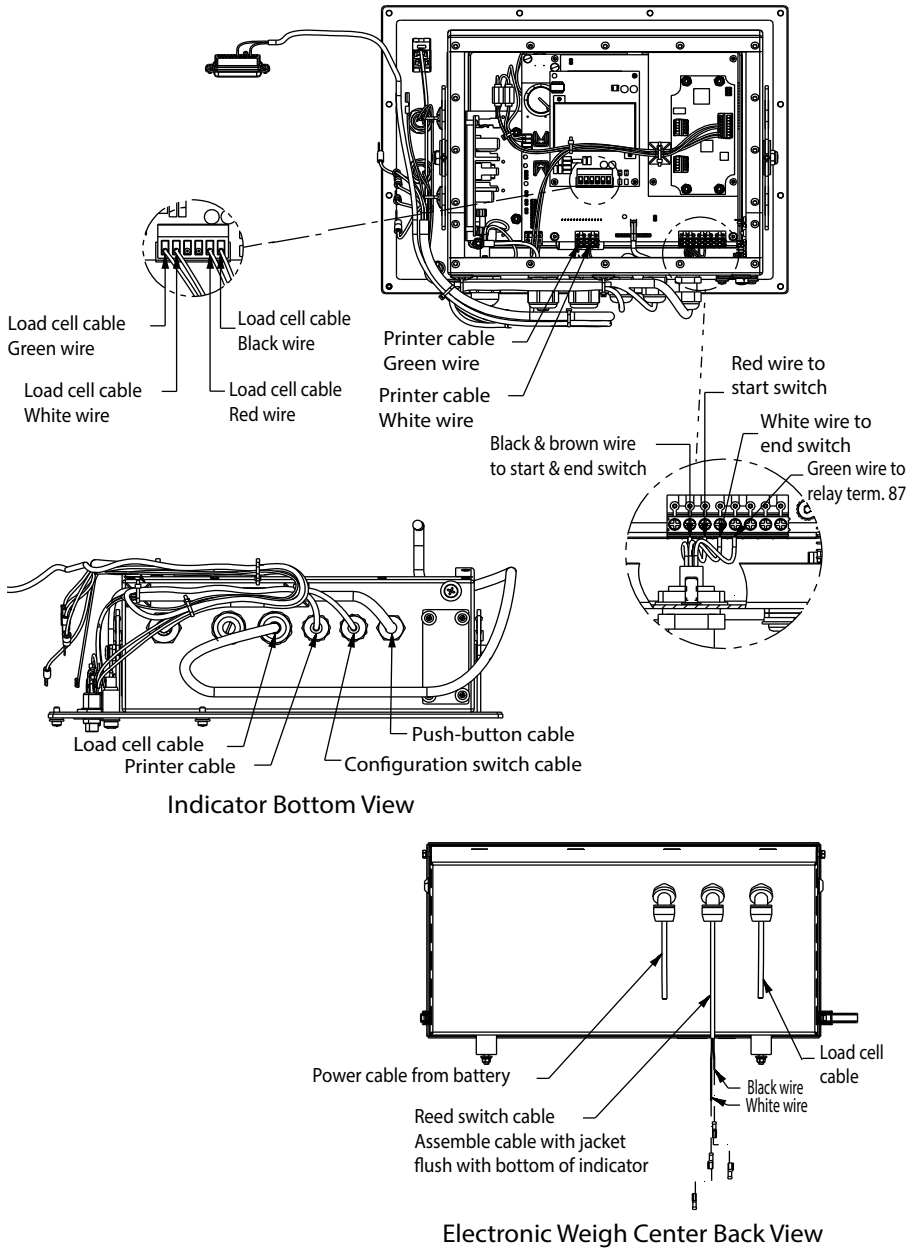


Figure 4-6. Figure 4-5 Electronic Weigh Center Wiring Diagram (Continued)

4.4 Linkage Disassembly and Assembly

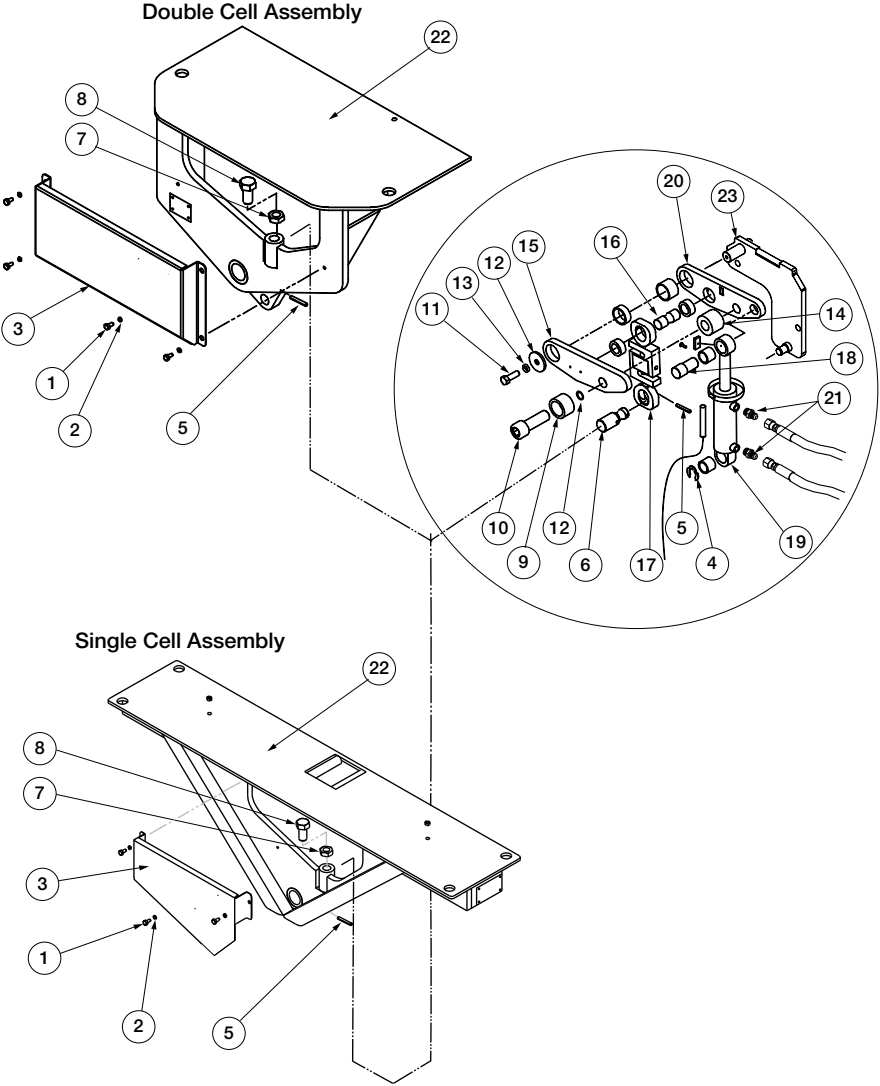


Figure 4-7. Disassembly/Assembly Diagram

To perform service on any of the scale parts (load cell, bushings), the linkage assembly must be disassembled. The following procedure must be followed when disassembling any linkage. See parts lists for item numbers.

Tools required:

- 7/16" wrench or socket
- 3/4" wrench or socket
- 3/4" hex Allen wrench (ratchet preferred)
- 1/4" roll pin punch
- Hammer
- Large flat-head screwdriver
- 11/16" wrench (required for hydraulics only)
- 5/8" wrench (required for hydraulics only)

Disassembly Procedure (see Figure 4-7.)

1. Remove load cell cover bolts (1) and lock washers (2) with 7/16" wrench and remove load cell cover (3).
2. Remove retaining ring from lower cylinder pin (4) with flat head screwdriver.
3. There are two roll pins (5) inserted through the lower load cell pin (6). Remove the roll pin at the end of the lower load cell pin that prevents the load cell assembly from jumping off the pin.
4. Loosen jam nut (7) on lockdown bolt (8) and turn lockdown bolt in with 3/4" wrench.
5. Loosen socket head cap screw assembly (9 and 10) with 3/4" allen wrench. Note: the cap screw and sleeve are pressed together and should not be separated. Sleeve will come out with cap screw.
6. Remove pivot pin bolt (11), washer (12), and lock washer (13) with 3/4" wrench.
7. Remove socket head cap screw assembly (9 and 10) and lift arm spacer (14).
8. Remove outer lift arm (15).
9. Remove upper load cell pin (16) and load cell assembly (17).
10. Remove upper cylinder pin (18) and hydraulic cylinder (19).
11. Remove inner lift arm (20).
12. Remove lower load cell pin (6) if required by removing the second roll pin (5) with roll pin punch and hammer.
13. Remove hydraulic fittings (21) if required with 11/16" and 5/8" wrenches.

Assembly Procedure (see Figure 4-7.)

1. Insert lower load cell pin (6) into lift plate (22)
2. Insert roll pin to hold the lower load cell pin in place with roll pin punch and hammer.
3. Assemble inner lift arm (20) onto pivot pin on base (23).
4. Assemble hydraulic cylinder (19) onto lower cylinder pin on base (23).

5. Insert upper cylinder pin (18) through cylinder (19) into inner lift arm (20).
6. Assemble load cell assembly (17) onto lower load cell pin (6).
7. Apply a thin film of grease onto ends of upper load cell pin (16).
8. Insert upper load cell pin (16) through upper eye bolt (17) into inner lift arm (20).
9. Assemble outer lift arm (15) loosely onto the three pins (pivot, upper load cell, and upper cylinder).
10. Place lift arm spacer (14) between two lift arm plates and press outer lift arm fully onto the pins.
11. Insert socket head cap screw assembly (9 and 10) and start threads, *do not tighten*, with 3/4" allen wrench.
12. Insert pivot bolt (11), washer (12) and lock washer (13) into pivot pin and tighten with 3/4" wrench.
13. Tighten socket head cap screw assembly (9 and 10) with 3/4" allen wrench.
14. Turn out the lock down bolt (8) until cylinder is extended between 1/8" and 1/4" with 3/4" wrench. Tighten the jam nut (7).
15. Insert roll pin (5) through the lower load cell pin (6) with roll pin punch and hammer to prevent the load cell assembly from jumping off the pin.
16. Insert retaining ring (4) on lower cylinder pin with a hammer.
17. Assemble hydraulic fittings (21), if required, with 11/16" and 5/8" wrenches.
18. Attach load cell cover (3) with load cell cover bolts (1) and lock washers (2) with 7/16" wrench.

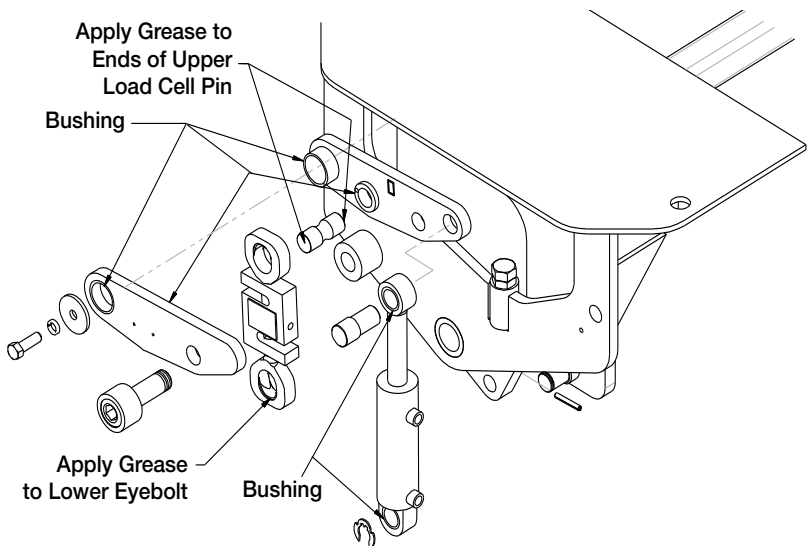


Figure 4-8. Linkage Assembly

Legal for Trade Inspection

The exact inspection procedures may vary slightly in your region from those described below. The following is the basic inspection procedure:

1. Balance test (as described in [Section 3.4 on page 50](#)).
2. Increasing/Decreasing load test.
3. Out of level increasing/decreasing load test.
4. Twist condition increasing/decreasing load test.
5. Out of level shut off test.
6. Printing of ticket.

Final Installation Checklist

Ensure a good consistent +12V DC power source.

Check proper operation of the hardware alarm.

Level Switch check. Turn on the indicator and move the truck onto a slope larger than 6 degrees. The indicator will show OFF LEVEL. Do this in all four directions – front high, front low, left high and left low.

Check to ensure the scale swings freely at all angles (does not contact anything off the scale)

After calibration is completed, check the lockdown adjustment (see [Section 2.7 on page 30](#)).

Check all hoses, wiring and any other components to ensure they do not interfere with the operation of the scale.

Ensure all mounting bolts are tight.

Check that fenders are mounted to the truck frame (not the scale).

Make certain all personnel using the scale have a full understanding of the operation and any safety precautions.

Name

Date



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