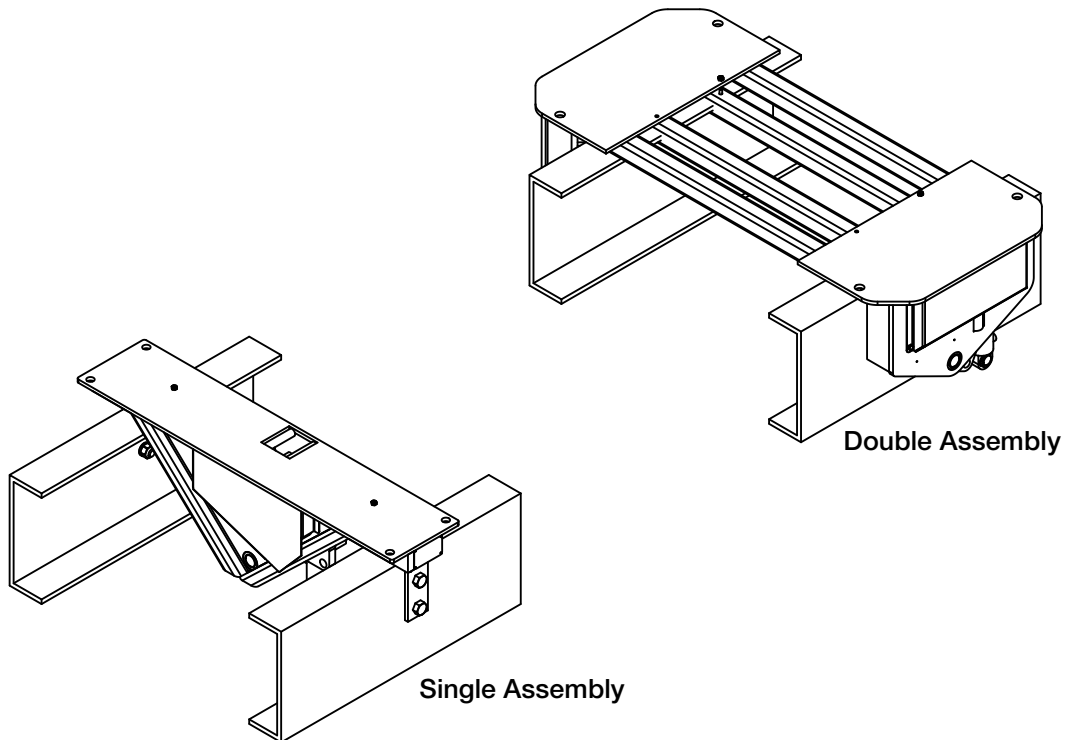


OnBoard

Low Profile Weighing System

Installation and Setup Manual



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1.0 Introduction

Congratulations on your purchase of a Low Profile ONBOARD Weighing System. This system is manufactured with top quality components and is engineered using the latest technology to provide operating features and reliability unmatched for years to come.

Please take the time to read this manual completely through before attempting to use the system. The ONBOARD system has been designed for easy set up and use. A thorough understanding of this manual will ensure that you receive the maximum benefit from the system.

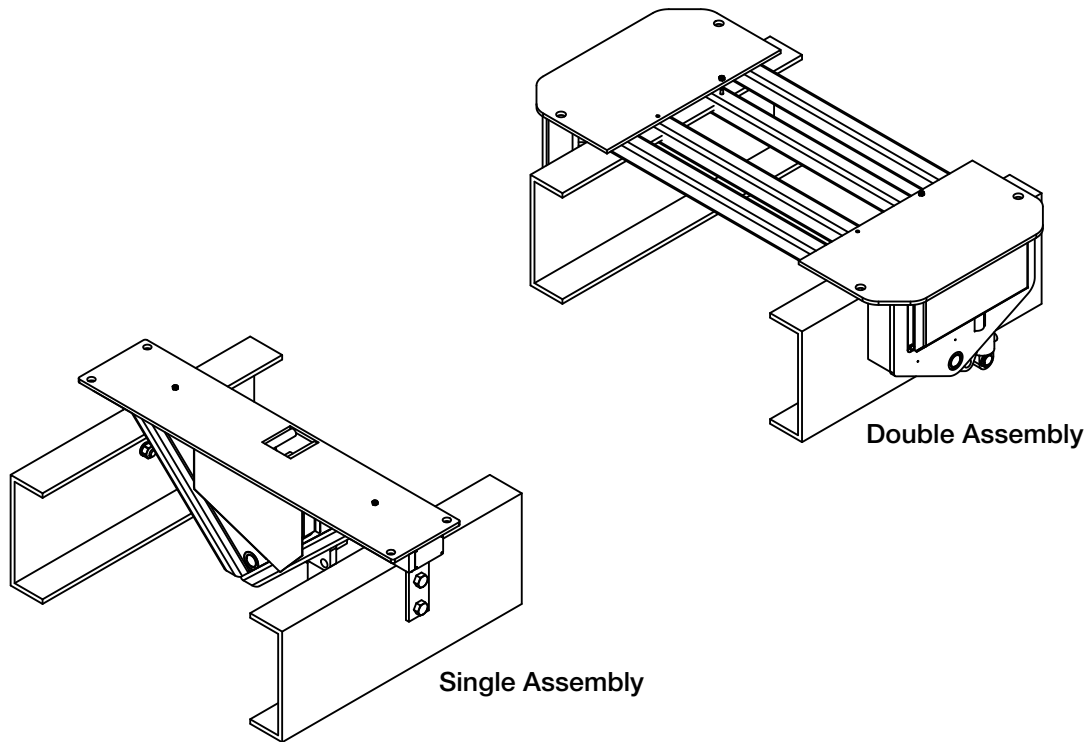


Figure 1-1. OnBoard Low Profile Weighing System

If you have any questions or comments please contact *Rice Lake Weighing Systems*:

Phone (toll free) 1-800-472-6703

1.1 Safety Section

Safety Signals

Safety Symbol Definitions:



Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.



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



Indicates a potentially hazardous situation that, if not avoided may 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 you have read and understand the instructions and warnings in the Installation, Operation and Maintenance Manual. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Rice Lake Weighing System dealer for replacement manuals. Proper care is your responsibility.



Before attempting to operate this unit, make sure every individual who operates or works with this unit has read and understands the following safety information.

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 up and down 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

The LOW PROFILE ONBOARD System is a patented, legal for trade, NTEP and Measurement Canada approved, mobile weighing device.

The LOW PROFILE ONBOARD System has a height profile of only 2-3/8". This allows the center of gravity of a truck to remain practically unchanged. The entire package is designed so that it is almost unnoticeable so as not to detract from the appearance of the unit. The scale modules come pre-assembled for ease of installation.

Features and benefits of the ONBOARD Weighing System include:

1. Quick transition between weigh and transport position (about 3 seconds)
2. Off level operation. The ONBOARD system can be used in very hilly terrain since it can operate up to six degrees out of level in any direction.
3. The measurement received from the scale is shown to you directly in lbs. or kg, so conversion from gallons or liters is not necessary.
4. The entire system is temperature compensated so it can be used at any time of the year in any weather condition.

1.3 Important Installation Notes

Following are some notes which must be followed when installing the Low Profile system.

1. Do not weld to any part of the scale system. Electrical currents required for welding can damage the load cells.
2. Clearance of at least 2" 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, etc.)

1.4 Vehicle and Container Selection

Vehicle selection is an important part of the installation process. When mounting the On-Board Low Profile system on a truck frame, care must be taken in selecting a truck that will carry the load and be balanced properly.

The container used to transport product must also be suitable for use with the On-Board Low Profile system. The container (tanks, body, etc.) 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" and 35".
2. Truck frame behind the cab must be as long as the container plus 6 to 12".
3. There must be enough axle capacity for the container, product, and scale components.
4. Truck must have a bumper attached to truck frame.
5. Fenders must be attached to the truck frame. (Fenders should not be attached 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. Tighten all connections securely before applying pressure.*

Truck requires a hydraulic pump with the following specifications

1. Maximum pressure capability of 3000psi (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). The following chart can be used to select the proper scale capacity.

Capacity Required	OB5-SGL5	OB10-DBL5	OB10-SGL10	OB20-DBL10	OB15-SGL15	OB30-DBL15
15,000 lbs. (7,000 kg)	1	1				
20,000 lbs. (9,000 kg)		2				
30,000 lbs. (13,500 kg)			1	1		
40,000 lbs. (18,000 kg)				2		
45,000 lbs. (20,000 kg)					1	1
60,000 lbs. (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 2" from any part of the scale (scale frame, tanks, etc.) to any fixed obstruction on the truck (cab, exhaust stacks, etc.). 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 1" past the weigh module.
10. It is preferred that the rear bumper be mounted directly to the truck frame.

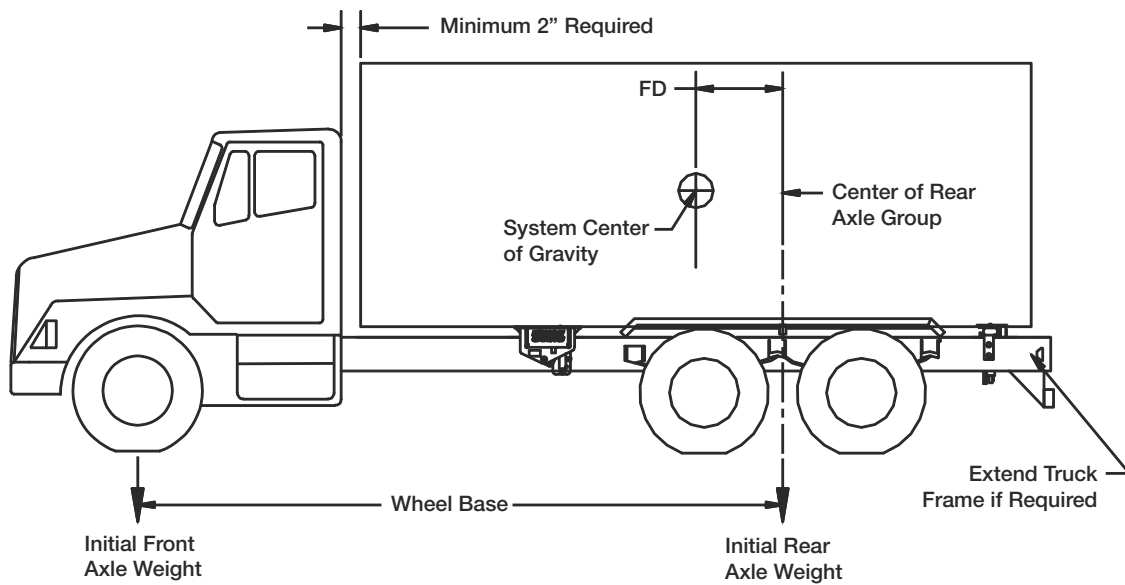


Figure 1-2. Weight and Balance

	Approximate Weight of Components (lbs.)			
	5K* or 10K*		15K*	
	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				
*5K-----OB5-SGL5 and OB10-DBL5				
*10K-----OB10-SGL10 and OB20-DBL10				
*15K-----OB15-SGL15 and OB30-DBL15				

Table 1-2. Weight of Installed Components Calculation

	Workspace	Example
Wheel base		216"
Initial Front Axle Weight		6800 lb
Initial Rear Axle Weight		6600 lb
Total Weight of Components (see above)		27600 lb
Forward Distance (FD)		28"
Final Front Axle Weight (see below)		10378 lb
Final Rear Axle Weight (see below)		30622 lb
$\text{Final Front Axle Weight} = \text{Initial Front Axle Weight} + \left(\frac{\text{FD}}{\text{Wheelbase}} \times \text{System Weight} \right)$		
$\text{Final Rear Axle Weight} = \text{Initial Rear Axle Weight} + \left(\frac{\text{Wheelbase-FD}}{\text{Wheelbase}} \times \text{System Weight} \right)$		

Table 1-3. Weight and Balance Calculation

2.0 Scale Installation

2.1 Truck Preparation

Before you mount your On-Board Weighing System onto your 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 to accumulate 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 3" clearance between the fenders and any part of the scale.

2.2 Scale Positioning

The scale must be positioned correctly 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 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 such that weight hangars 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 (6 degrees in all directions). See the following figures for details.

2.2.1 Three Cell System

(One single and one double module 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.

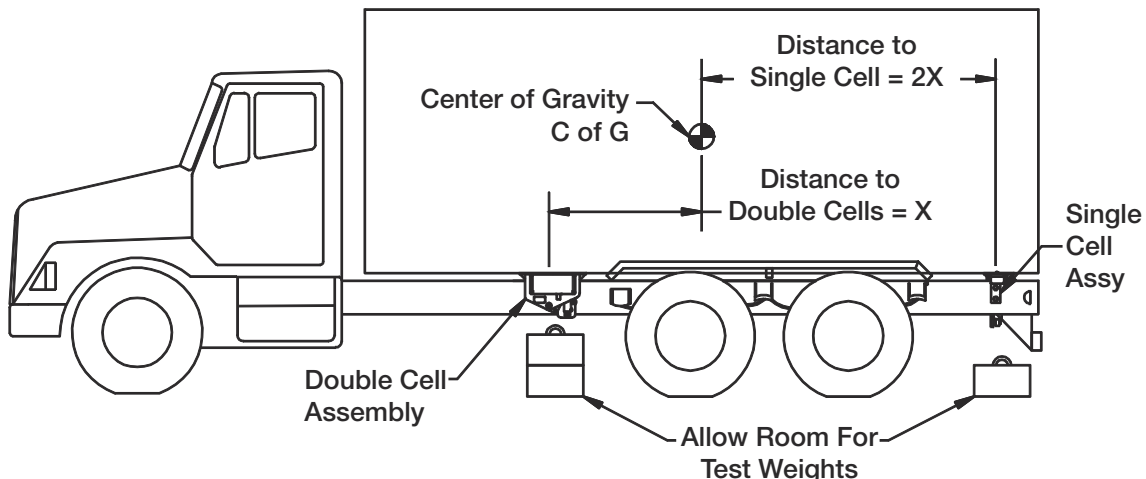


Figure 2-1. Double / Single Scale Positioning

2.2.2 Four Cell Systems

(Two double module assemblies OR one double and one tandem assembly)



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.*

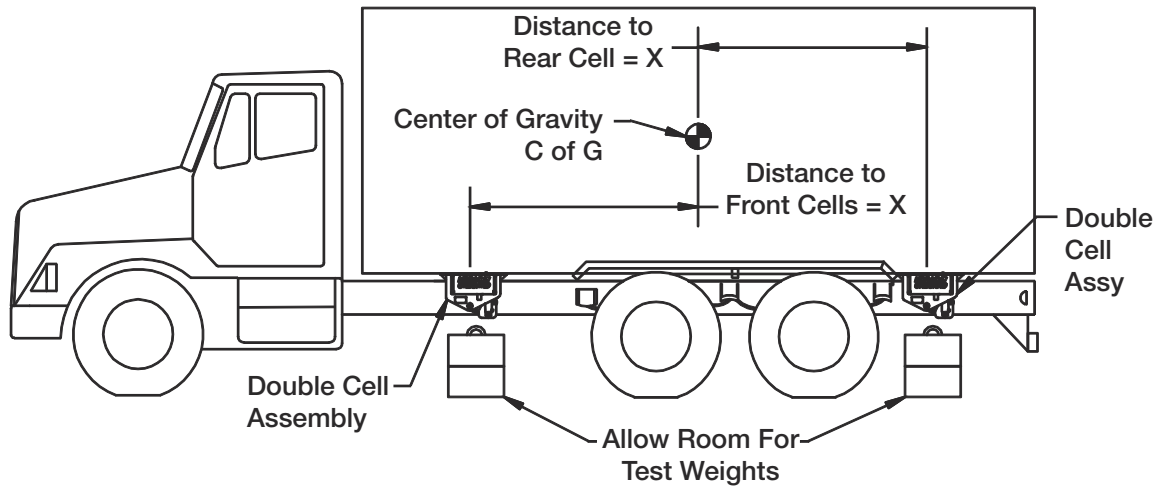


Figure 2-2. Double / Double Scale Positioning

2.3 Attachment of Scale to Truck

1. Position the scale modules on the truck frame as per 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" 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"x2 1/2" grade 8 bolts, 3/4" nuts, and 3/4" lock washers supplied.
6. Torque the 3/4" bolts to between 90-110 ft.-lbs.
7. Remove shipping alignment bolts.

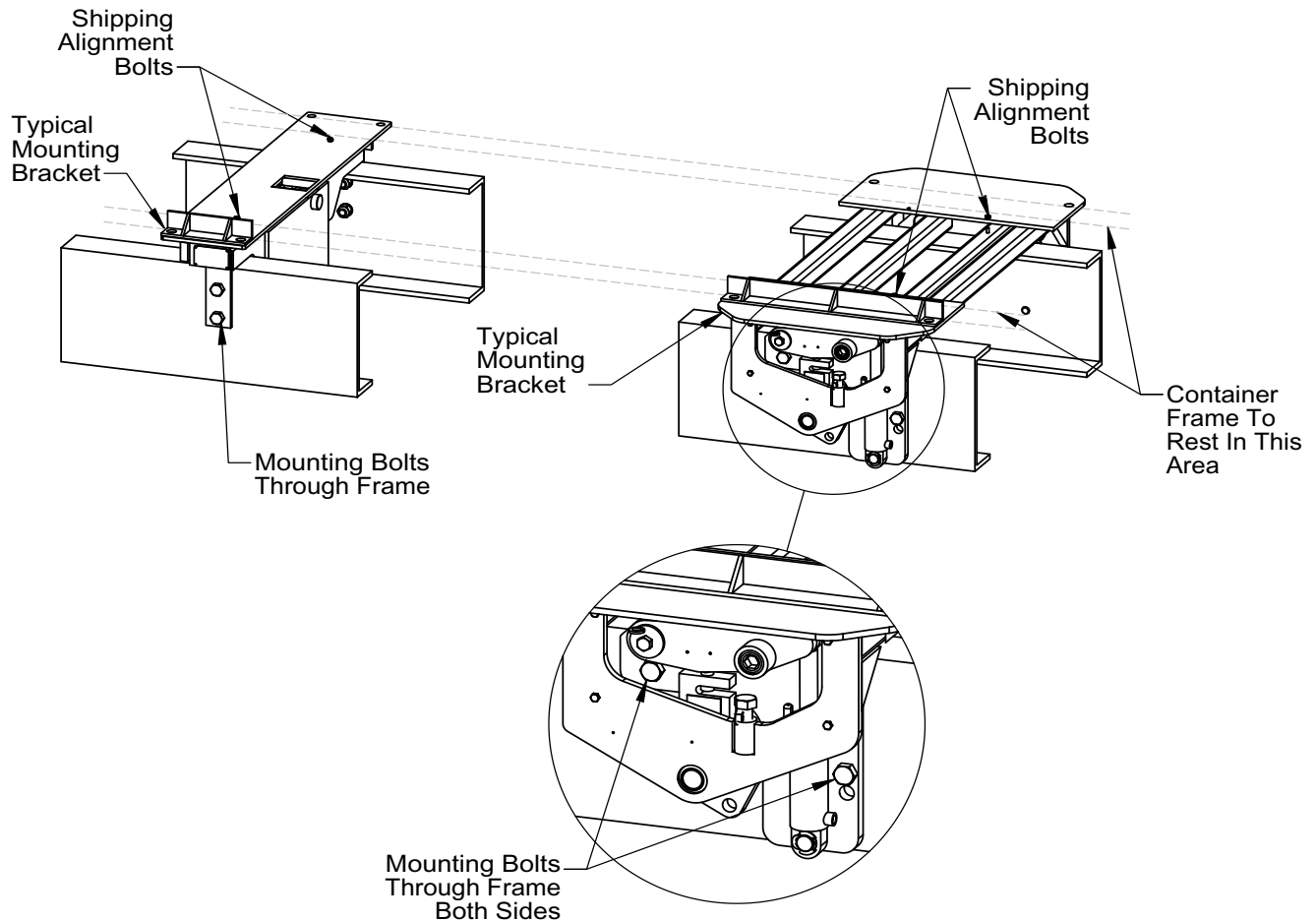


Figure 2-3. Attachment of Scale to Truck Frame

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.-lbs.)
5K or 10K	3/4"	5/8" Grade 8	70 – 90
15K	7/8"	3/4" 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 $\pm 1/16"$.



Important 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.

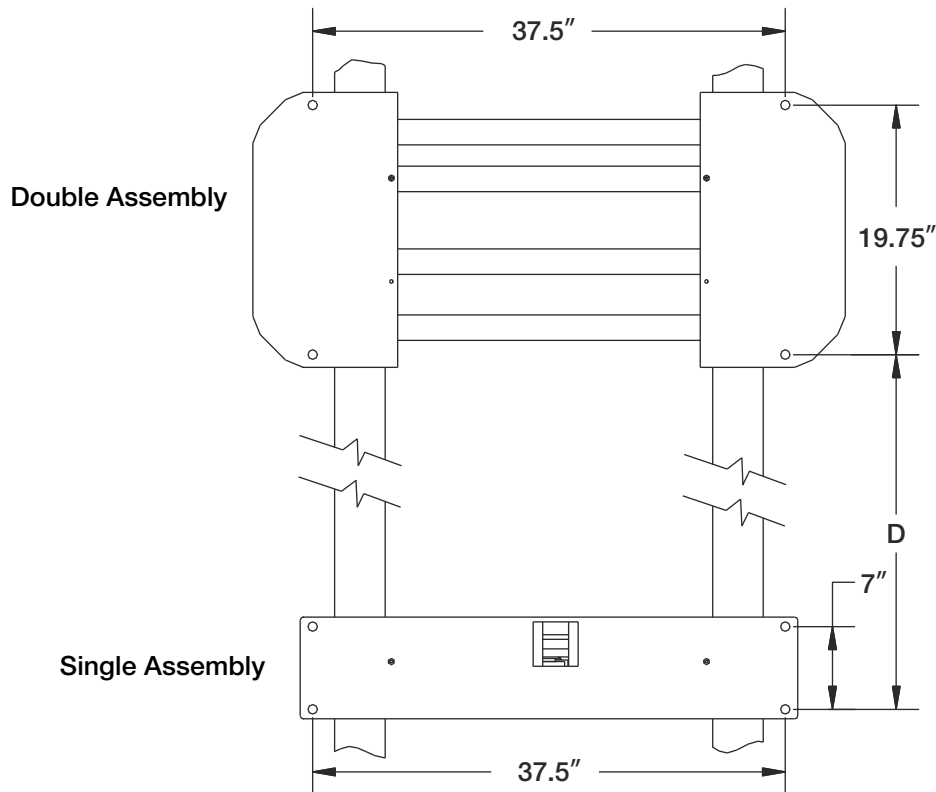


Figure 2-4. Mounting Hole Dimensions

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 2-5.

1. Attach the line locks to the truck frame, using the bolts, nuts, and washers provided. Position the line locks such that there is some slack in the hoses to allow for cylinder motion (see below).
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 port of the cylinders. These fittings are 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.

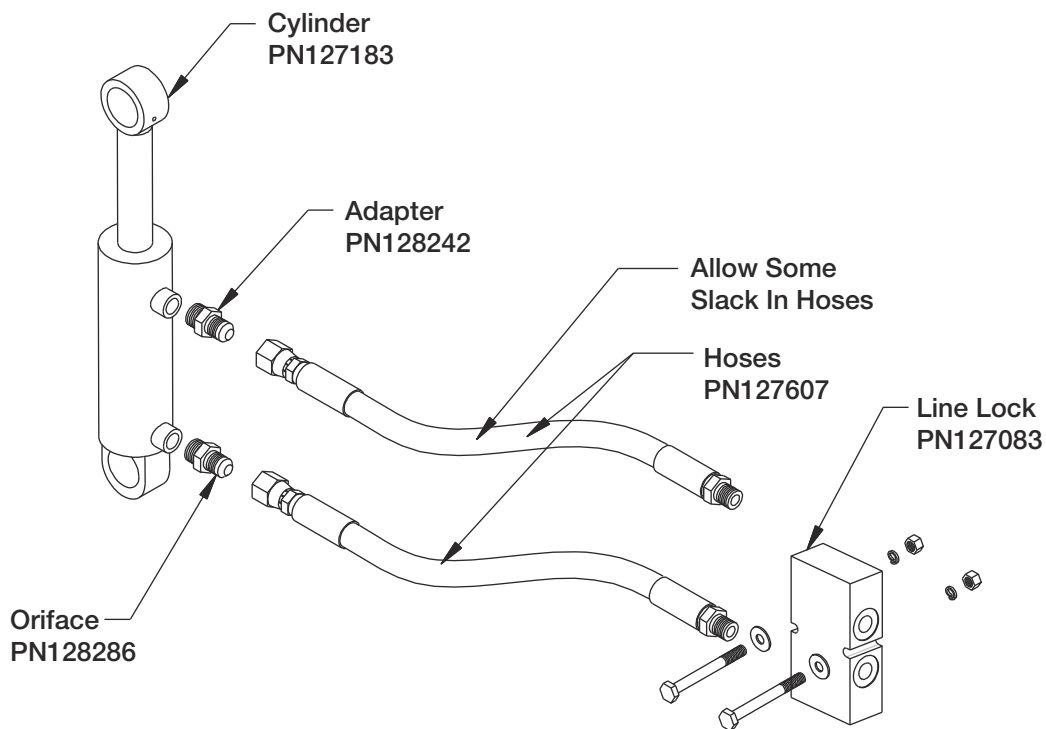


Figure 2-5. Assembly of Hydraulic Components

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 On-Board systems are shown in Figure 2-6 and Figure 2-7.

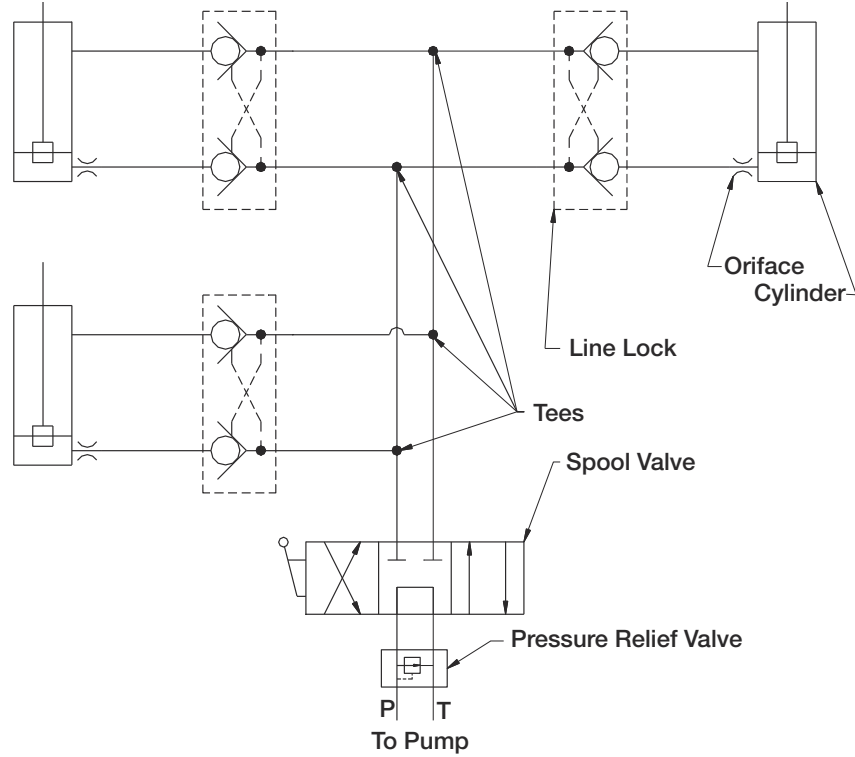


Figure 2-6. Hydraulic Schematic for 3 Cell Systems

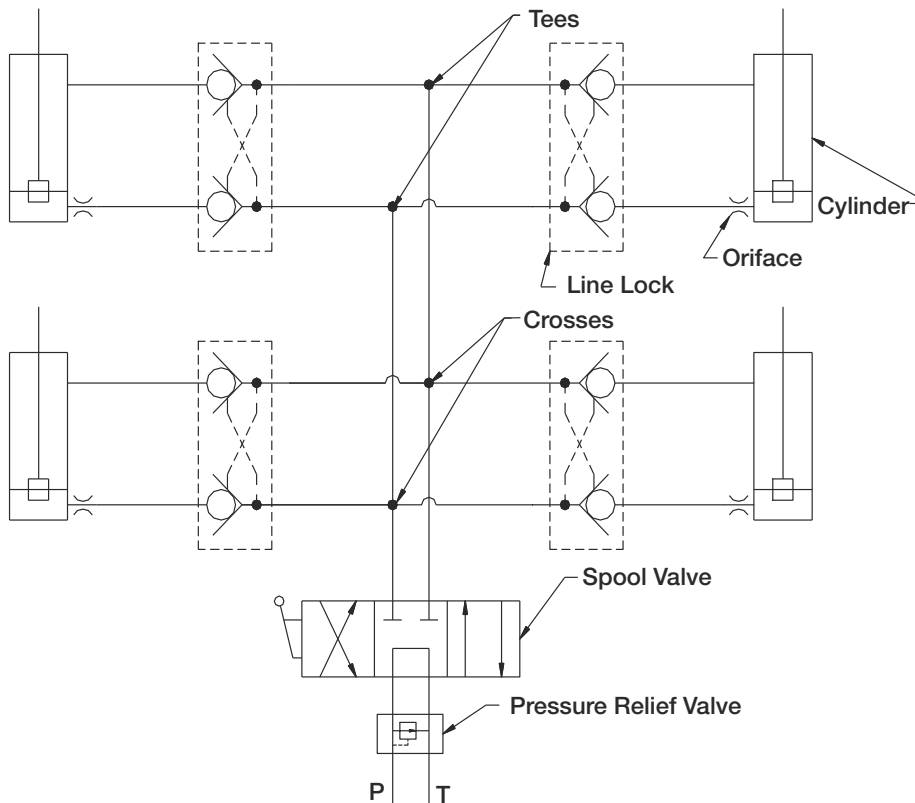


Figure 2-7. Hydraulic Schematic for 4 Cell Systems

2.5.3 Valve to Pump

The hydraulic pump on the truck can be plumbed to the control valve. Simply 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 ensures 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. **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 5 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 2-8., below, shows the dimensions for mounting the enclosure.

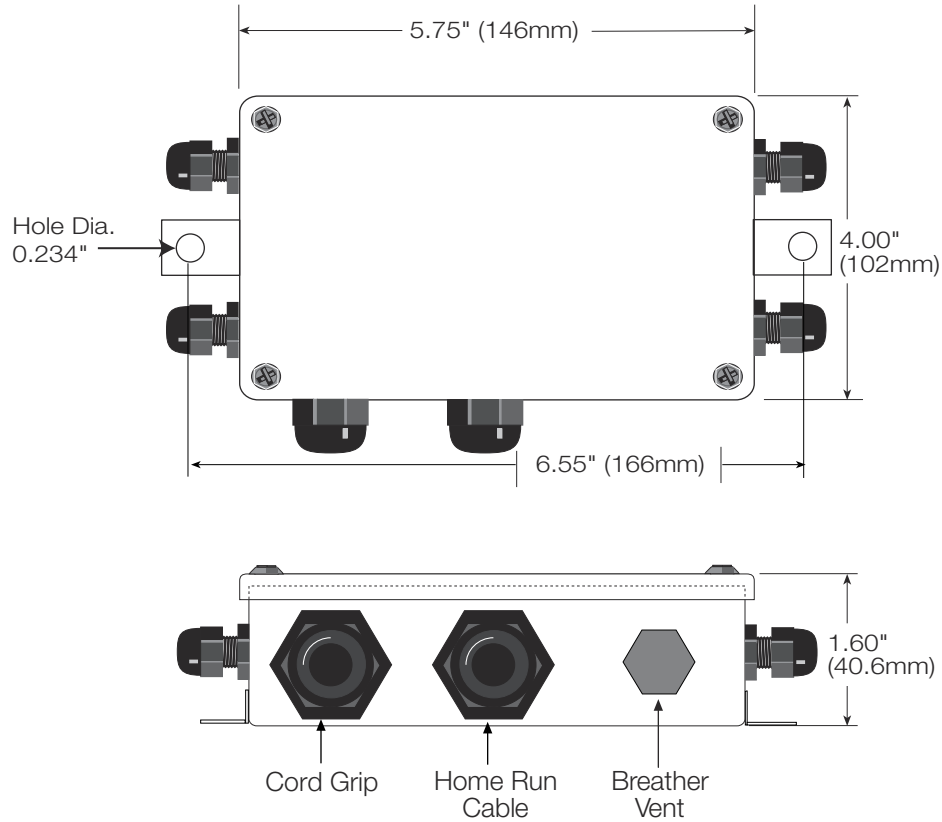


Figure 2-8. JB4ES and JB4SS Enclosure Dimensions

2.7 Lock Down Bolt Adjustment

The lock down bolt is adjusted at the factory. However, to ensure proper lock down of the container, check the lock down 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 2-9). **As well, the load cell should be loose in the lock down position.**

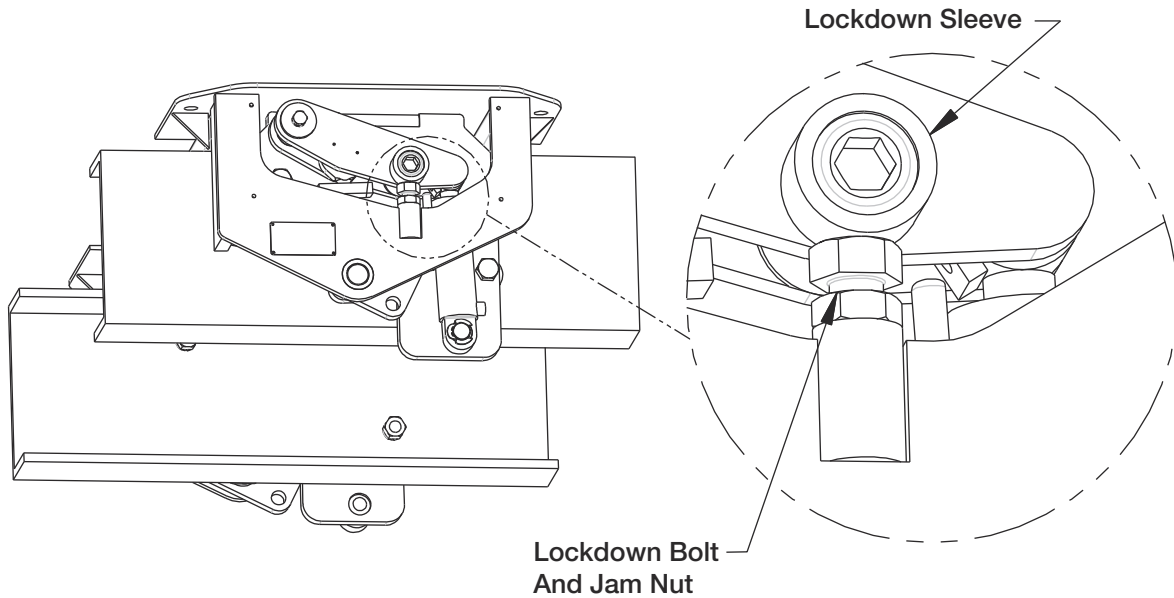


Figure 2-9. Lock Down Adjustment

2.8 Weigh Center Mounting

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

Important *The 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 Series Weigh Center

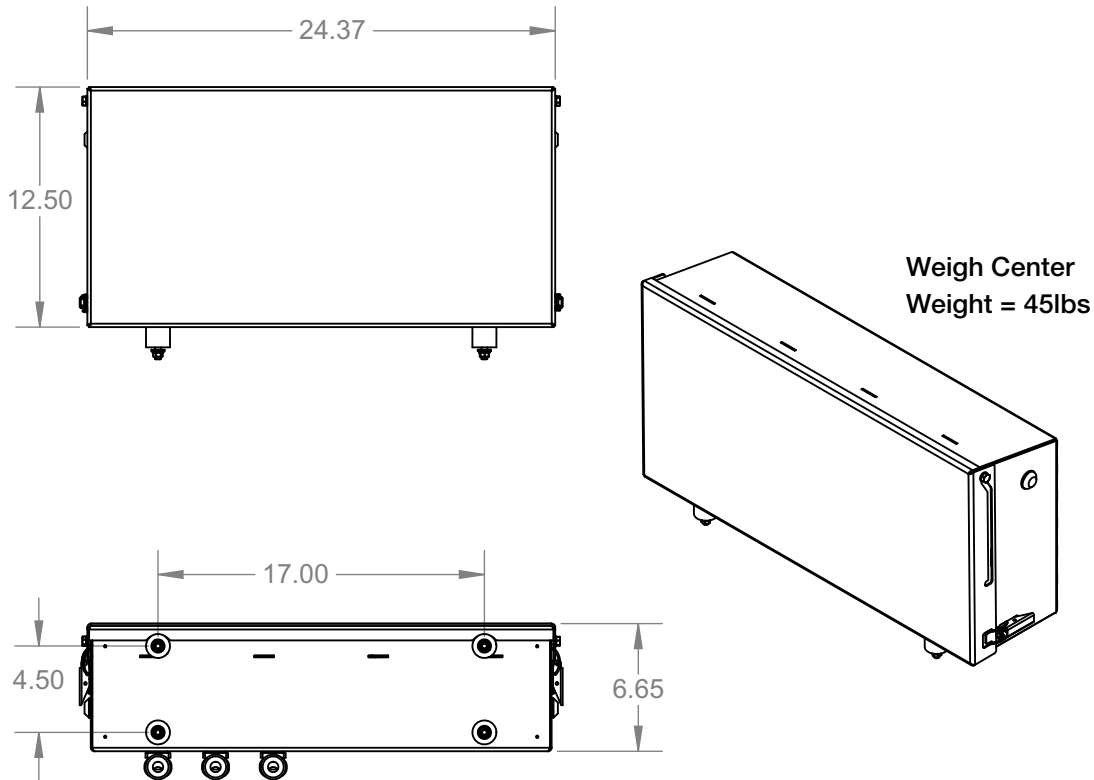


Figure 2-10. Weigh Center Dimensions

The 920i series weigh center 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 *Weigh Center mounting brackets are available from Rice Lake Weighing Systems with drawings provided that are suitable for manufacturer.*

Important *The red light 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

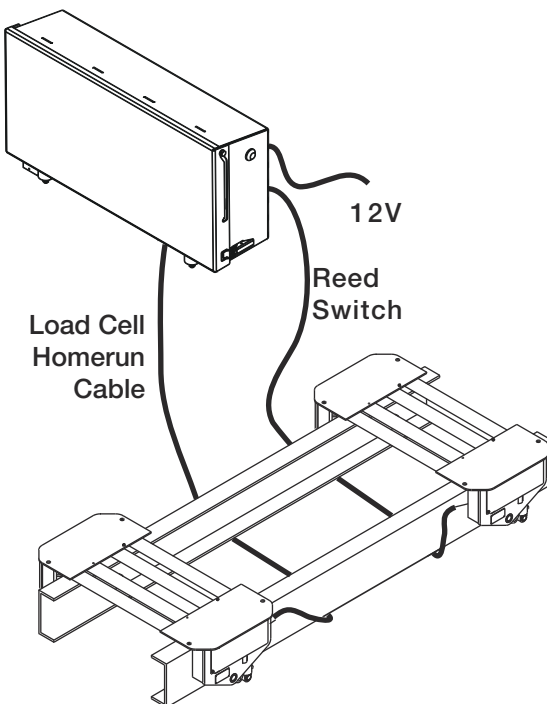


Figure 2-11. Exterior Weigh Center Connection

The scale electrical system consists of a 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

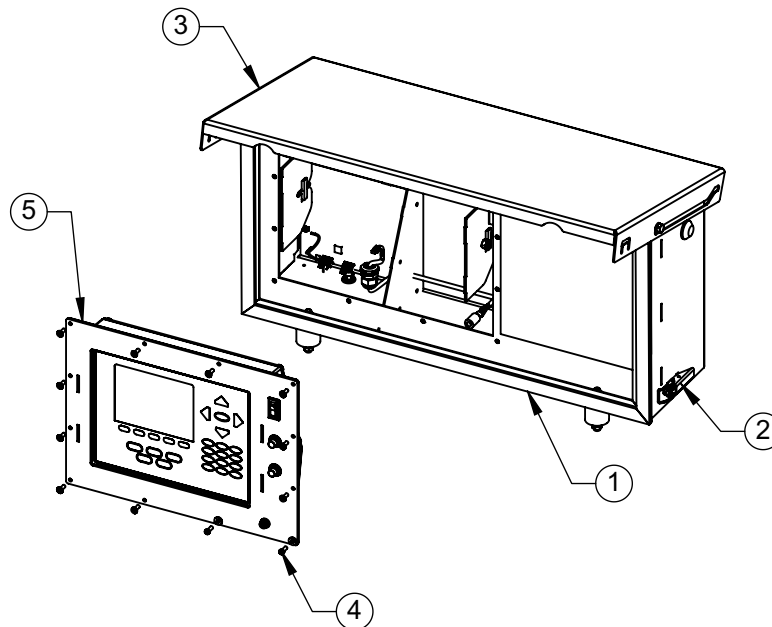


Figure 2-12. Removal of Indicator Panel Mount

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 *Reassembly by reversing the order above.*

2.10 Conduit Connections

Follow for assembly of conduit connectors.



Note Rice Lake Weighing Systems supplies 80 feet of conduit cable with each system. Additional cable can be purchased at time of order.

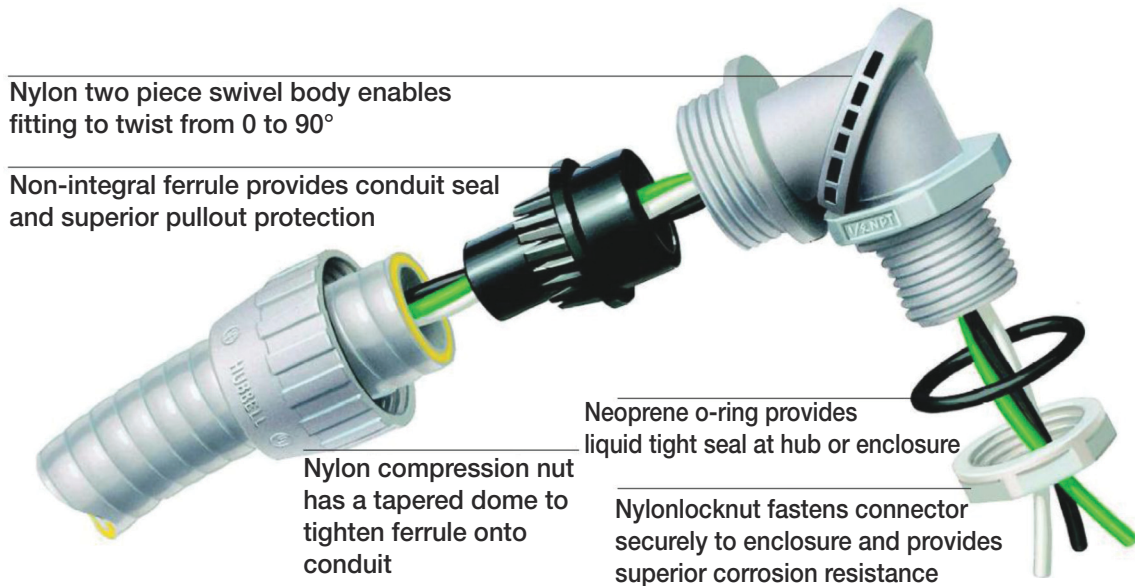


Figure 2-13. Non-Metallic Conduit Connectors

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 water tight.

2.10.1 Conduit Termination

The keep moisture and unwanted pests and debris from the cable, **before** pulling the wire through the conduit, install the sealing grommet & bushing over the cable that is run inside the conduit, if applicable.

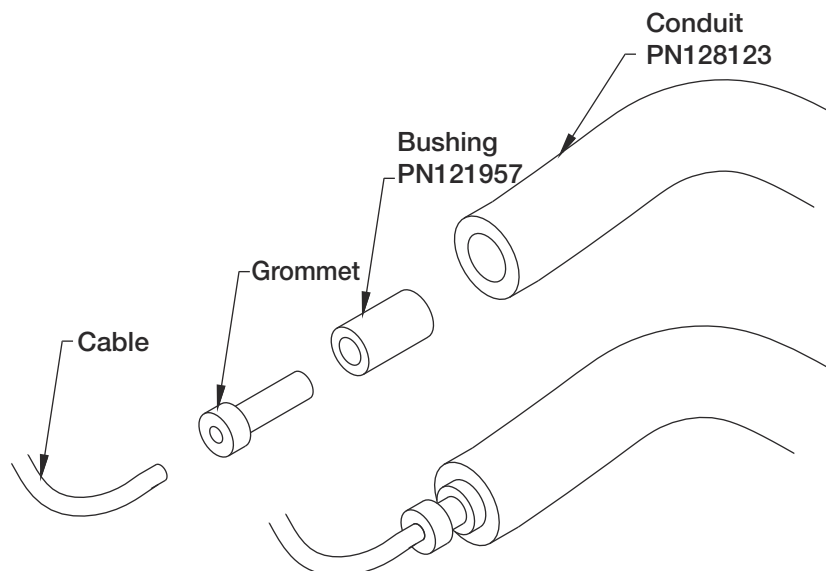


Figure 2-14. Conduit Termination

2.10.2 Reed Switch (Hardware Alarm)

The On-Board 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 physically mounted at the factory, but must be electrically connected at 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 2-16.
4. Test the alarm by raising the scale. When the scale is in the weigh position the alarm is activated. Lower the scale into the transport position the alarm should turn off.

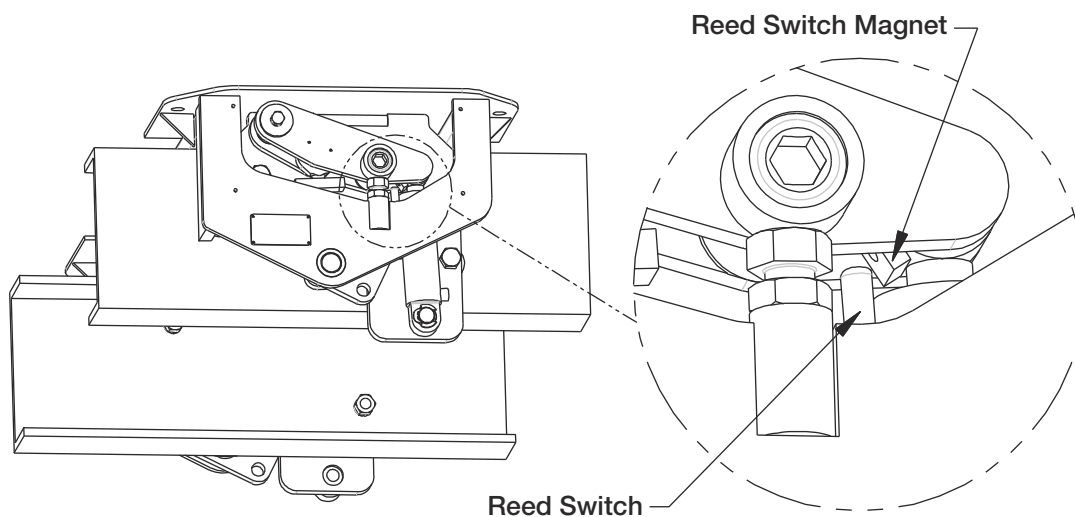


Figure 2-15. Reed Switch and Magnet Location

2.10.3 Power (Truck) Cable

Included with the weigh center is a 3-conductor 14-gauge cable that supplies power to the weigh center. This cable is referred to as the truck cable. The truck cable has the following wiring color code:

BLACK - GROUND

WHITE - +12V DC (switched and fused)

1. Route the Power cable through the strain relief in the 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 in the power cable into the corresponding connector in the weigh center. See Figure 2-16.
7. With the 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.

2.10.4 Wiring In 920i Weigh Center

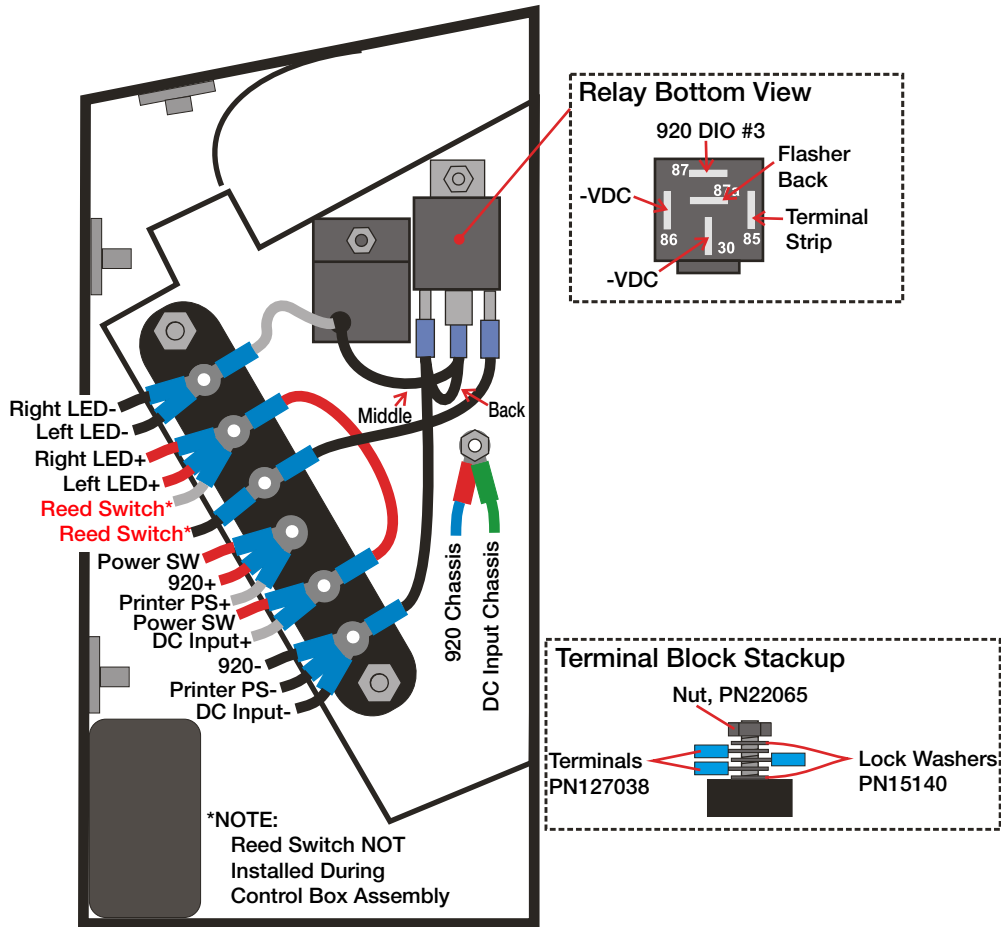


Figure 2-16. Terminal Block Connection

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 with ¼" bolts and lock washers.

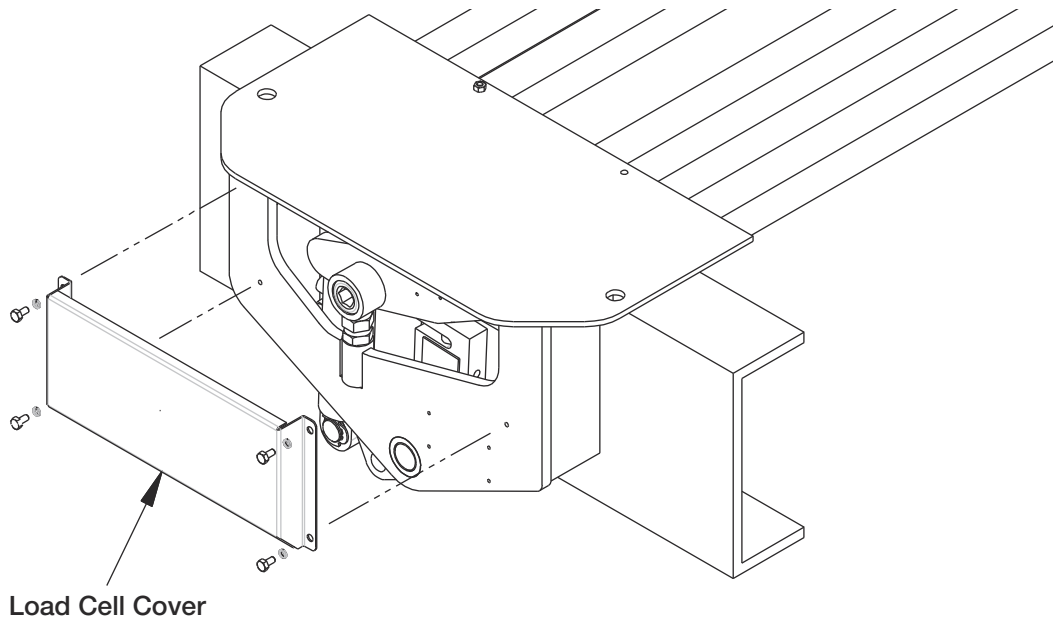


Figure 2-17. Load Cell Cover

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 (see and).

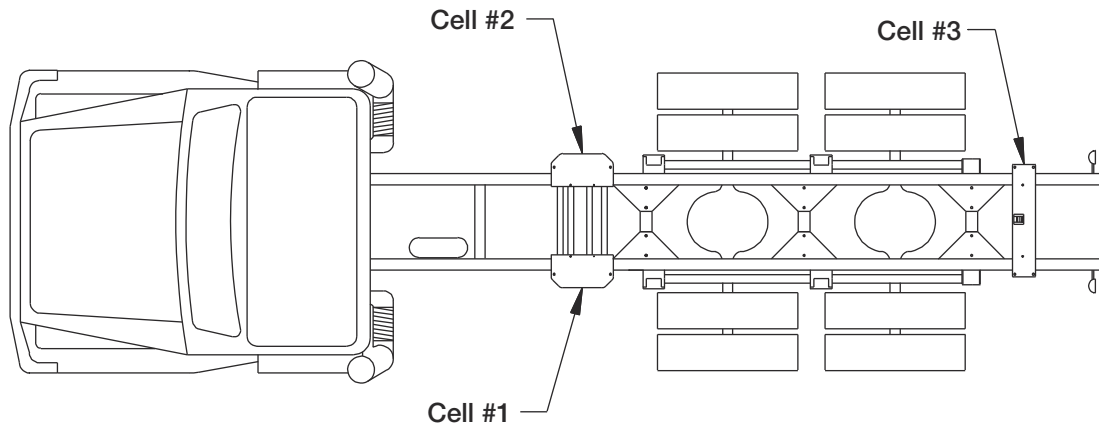


Figure 2-18. Load Cell Numbering for 3 Point System

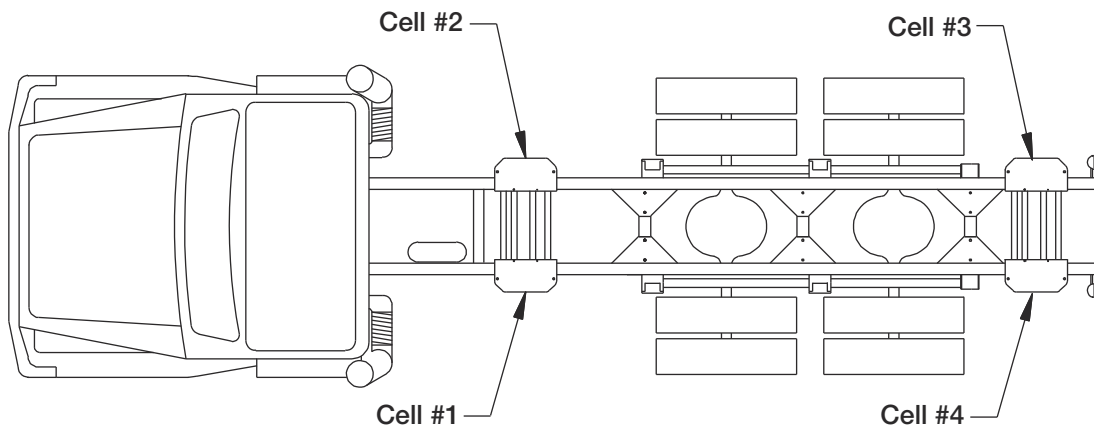


Figure 2-19. Load Cell Numbering for 4 Point System

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. Installation of the conduits ends is shown on page .
3. Feed load cell wires through conduit. The load cell wires must have a small amount of wire loose 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. **Load cell wires must not be cut closer than 6 feet away from the load cell (i.e. at least 6 feet of wire must be left attached to the load cell). The scale must be balanced and calibrated AFTER cutting load cell wires.** See for where to wire the load cells to the circuit board.

5. For each load cell attach to the load cell cable according to . 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 2-20. 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

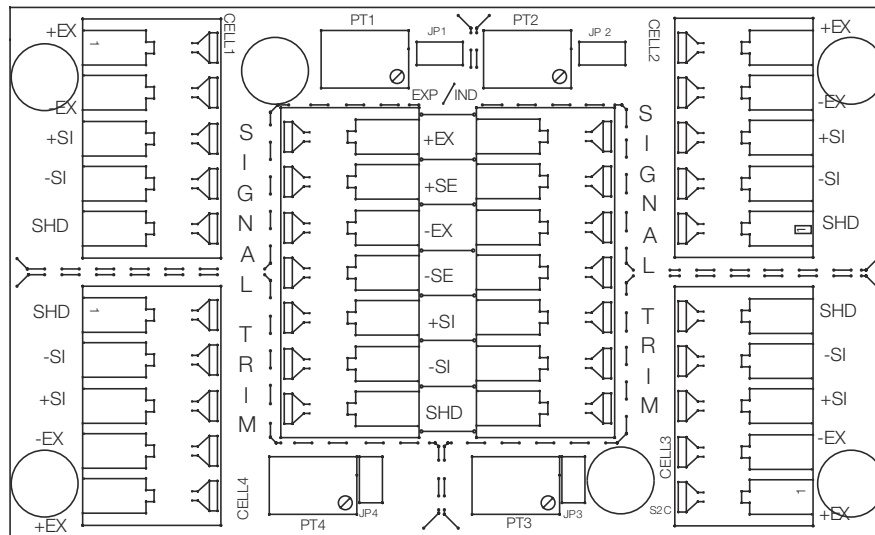


Figure 2-20. Junction Box Indicator Terminal

2.13 920i Indicator Junction Box Cable Installation In ???

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 2-21). Wire the load cell cable from the load cell or junction box to connector J1 as shown in Table 2-2.

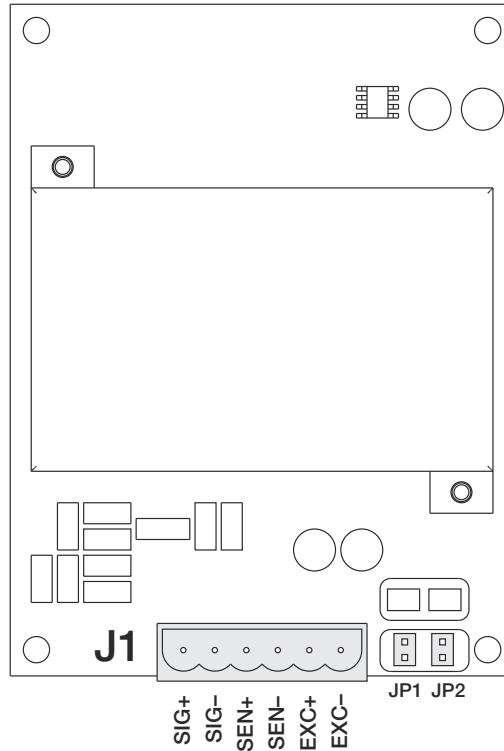


Figure 2-21. Single-Channel A/D Card

If using 6-wire load cell cable (with sense wires), remove jumpers JP1 and JP2 before reinstalling connector J1. For 4-wire installation, leave jumpers JP1 and JP2 on. For 6-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 6-wire load cell connections to connector J1, remove jumpers JP1 and JP2. For 6-wire load cell connections to connector J2 (dual A/D cards), remove jumpers JP3 and JP4. 	

Table 2-2. A/D Card Pin Assignments

Figure 1

3.0 920i OnBoard Weigh Center



Important Configuration and Calibration should be performed only by a Rice Lake Distributer for Legal For Trade Sealing.

3.1 Configuration

The 920i weigh indicator (integral in the weigh center) is set-up with all required parameters when it is shipped with the On-Board System. To interact with installed hardware the common parameters requiring configuration to all On-Board systems are shown in Table 3-1. The appropriate parameter values for popular net capacities are listed in Table 3-2 and Table 3-3. Double check that the parameters are set appropriately for your system.



Note For a more detailed summary and instructions of Configuration see the 920i Installation Manual (PN 67887).

Configuration of the displayed capacity and resolution is required.

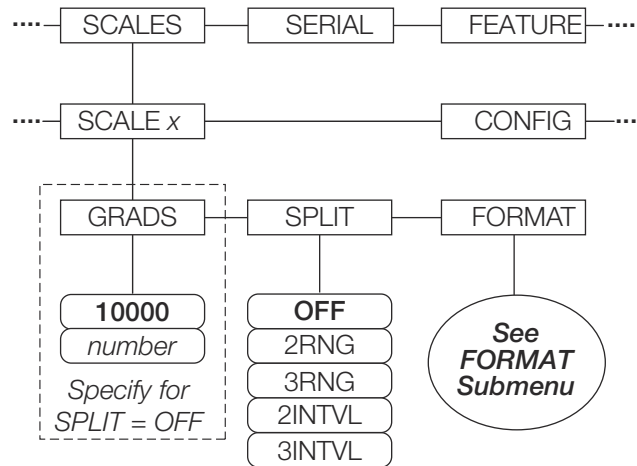


Figure 3-1. Scales Menu

SCALES Menu		
Parameter	Choices	Description
<i>Level 2 submenus</i>		
SCALEx		Allows configuration and calibration of each scale
CONFIG		Lists available and associated A/Ds
<i>Level 3 submenus</i>		
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 submenu.
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 submenu descriptions in Figure 3-2. Also see 920i Manual for further descriptions.

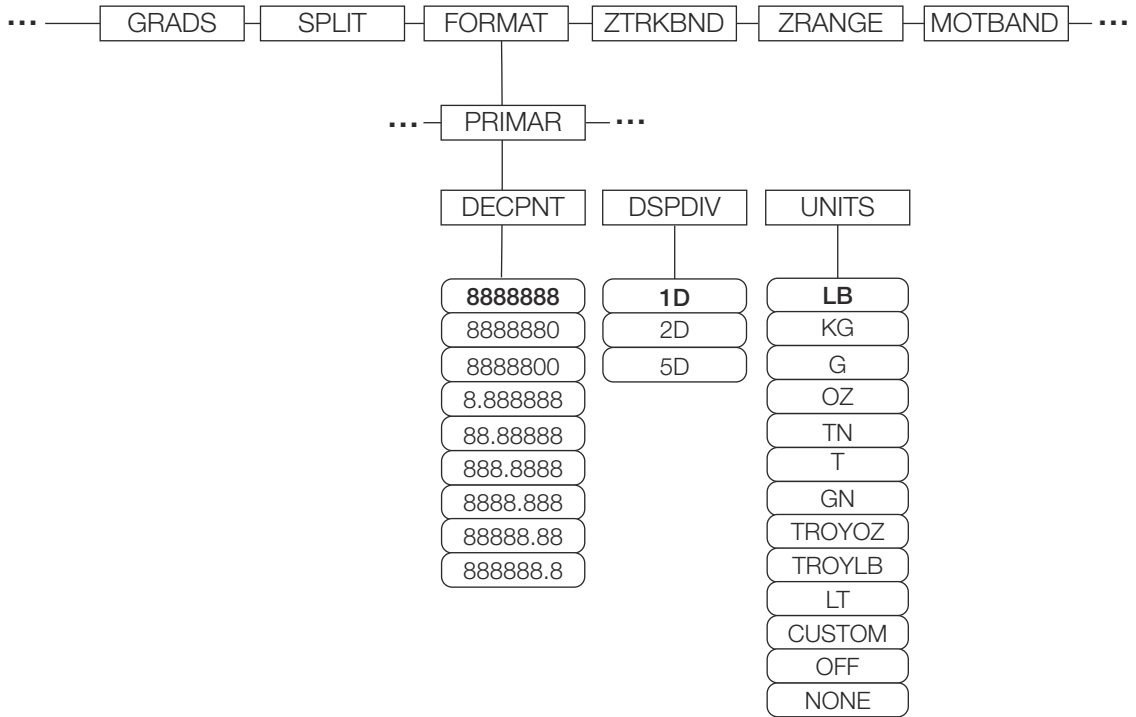


Figure 3-2. Format Menu

SCALES Menu, FORMAT Submenu, 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 submenu 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 zeroes 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.
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	

3.2 Zero The Inclinometer



Important The inclinometer has been zeroed at the factory on a level surface. Performing this function once the control center has been installed must be done with the system display level.

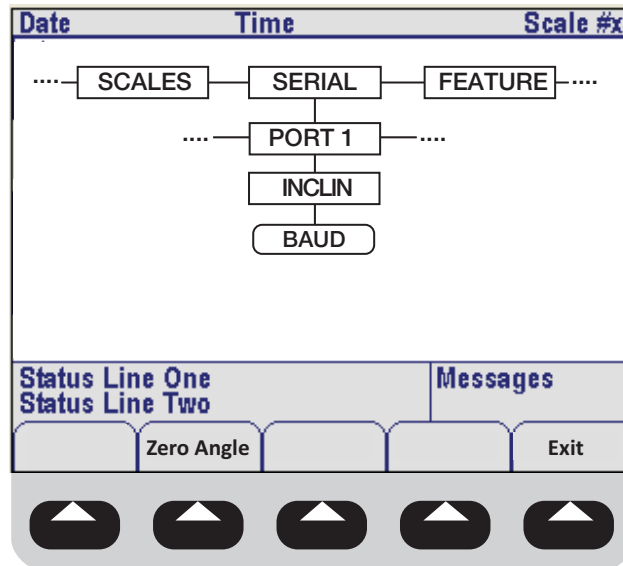





Figure 3-3. Inclinometer Settings

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 - will have to check the angle indications to verify.

6. Press  to return to normal weigh mode.

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.

3.3 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.

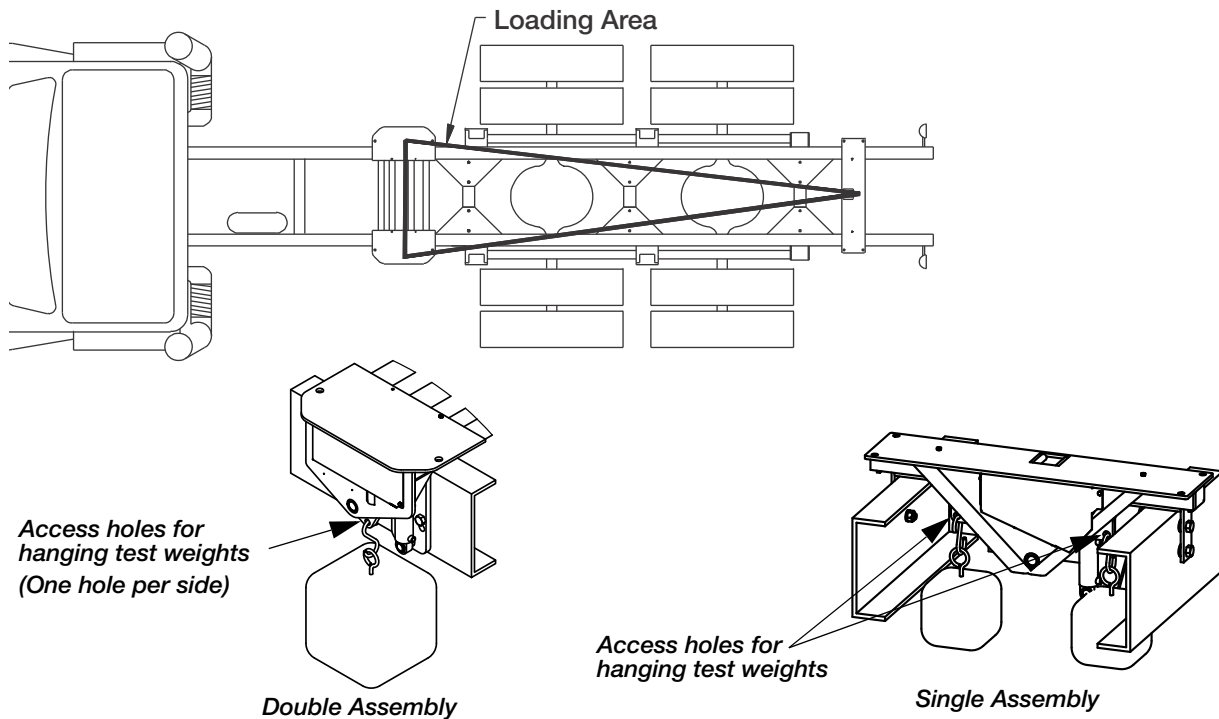


Figure 3-4. Loading Area

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 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 OnBoard 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 free.
3. Raise the scale. "Dead load" the test rack by following the Calibration Procedure in Section 3.1. Load weights on the rack to the full capacity of the scale: 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 cell by placing the balancing weights on that corner of the tank (inside the triangle noted above). Keep the weights as close to the cell as possible directly above the cell being preferred. 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.

- Repeat step 4 for the other 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 one percent (1%) 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.
- Pick the lowest reading and adjust the other cells down to this value with the trimmers inside the j-box.
- With no weight on the scale, zero the indicator. Then turn all four potentiometers (shaded areas of 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.

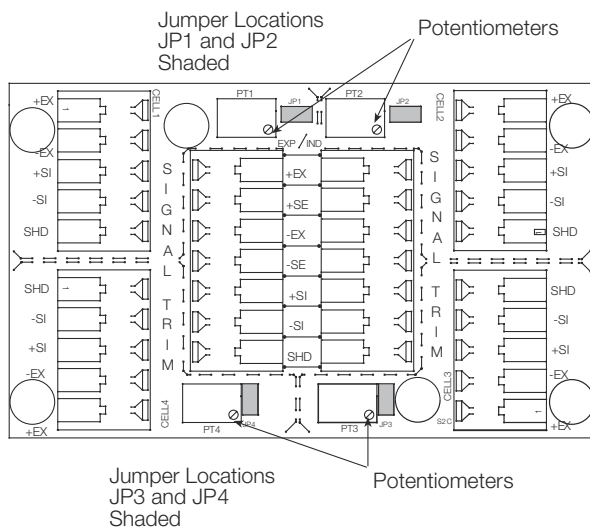


Figure 3-5. Trim Potentiometers

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.

- Test the final balance by loading each cell again and recording the 920i readings. The 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).
- The system can now be calibrated.

EXAMPLE: OB30L-F3 System

Balancing Weights

English = 5000 lb.

Metric = 2000 KG

Graduations

English = 5 lb.

Metric = 2 KG

English Units (lbs.)			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 3-1. First Loading

From the above results, it can be seen that cells 1 and 3 must be adjusted down to read 4990 lbs. (1996 kg in the metric example). First, the trimmer for cell 1 is turned clockwise to bring the reading down (step 6).

English Units (lbs.)			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 3-2. Second Loading

Next, the trimmer for cell 3 is turned clockwise to bring its reading down. Because this cell is being adjusted by three graduations, the procedure in 6(d) should be followed, adjust cell 3 down to 4985 lbs. (1994 kg in the metric example) and check for a zero shift.

English Units (lbs.)			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 3-3. Third Loading

The unloaded reading is found to be -5 lb (-2 kg), indicating a zero shift. The scale must therefore be re-zeroed, and cell 3 checked again.

English Units (lbs.)			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 3-4. Fourth Loading

THE CELLS ARE NOW BALANCED WITHIN THE TOLERANCE OF ONE GRADUATION.

3.4 Calibration

The CALIBR submenu (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 Zero** Recalls the last established zero value to allow calibration without removing tests weights or product from scale.
- Calibrate** Performs calibration for the selected point
- Temp Zero** Temporarily zeroes 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

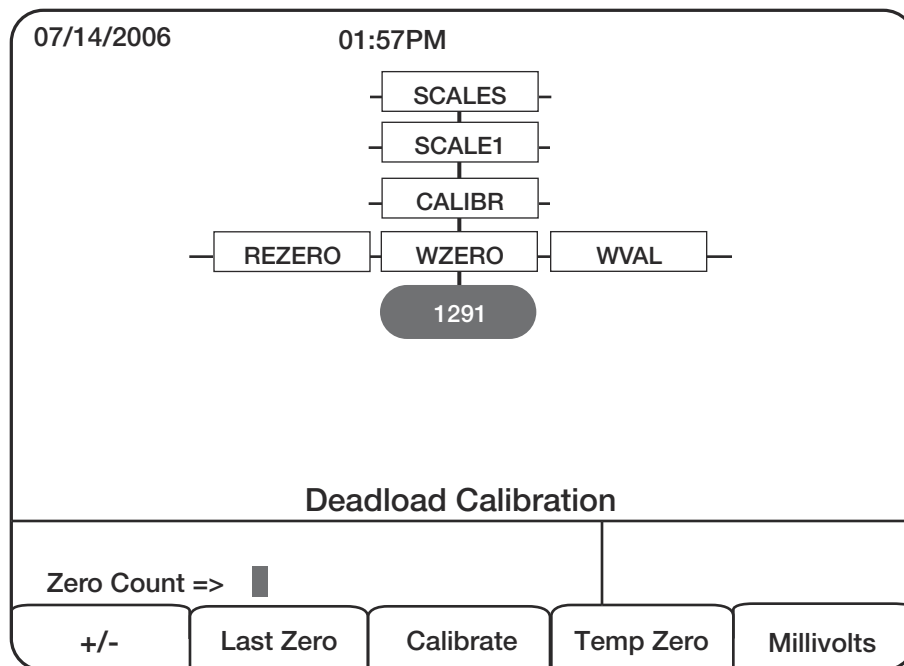


Figure 3-6. WZERO Calibration Display

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 the **down** key, then select the scale to be calibrated. Press **down** again (*GRADS* parameter highlighted), then press **left** to highlight the *CALIBR* submenu. Press **down** to go to zero calibration (*WZERO*). See Figure 3-6 on page 30.
3. Ensure scale is empty, then press **down** again to show the current *WZERO* value, then press the **Calibrate** softkey to calibrate zero. When complete, the new A/D count for the zero calibration is displayed. Press **enter** to save the zero calibration value and go to the next prompt (*WVAL*).
4. With *WVAL* displayed, press **down** to show the stored calibration weight value. Use the numeric keypad to enter the actual value of the calibration test weights, then press **enter** to save the value and go to span calibration (*WSPAN*).
5. Place test weights on scale. Press **down** again to show the current *WSPAN* value, then press the **Calibrate** softkey to calibrate span. When complete, the new A/D count for the span calibration is displayed. Press **enter** again to save the span calibration value and go to the next prompt (*WLIN*).

6. Five-point linearization (using the *WLIN* parameter) provides increased scale accuracy by calibrating the indicator at up to five additional points between the zero and span calibrations. 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:
With *WLIN* displayed, Press **down** to go to the first linearization point (*POINT 1*). Press **down** again to show the weight value prompt (*WGT 1*), then **down** once more to show the weight value. Place test weights on the scale, then use the numeric keypad to enter the actual test weight value. Press **enter** to save the value and move to the calibration (*CAL 1*) prompt. Press **down** to show the current calibration value, then press the **Calibrate** softkey to calibrate the linearization point. When complete, the A/D count for the linear calibration is displayed. Press **enter** again to save the calibration value and go to the next prompt (*POINT 2*).
Repeat for up to five linearization points. To exit the linearization parameters, press the **up** key to return to *WLIN*.
7. The optional re-zero function is used to remove a calibration offset when hooks or chains are used to hang the test weights.

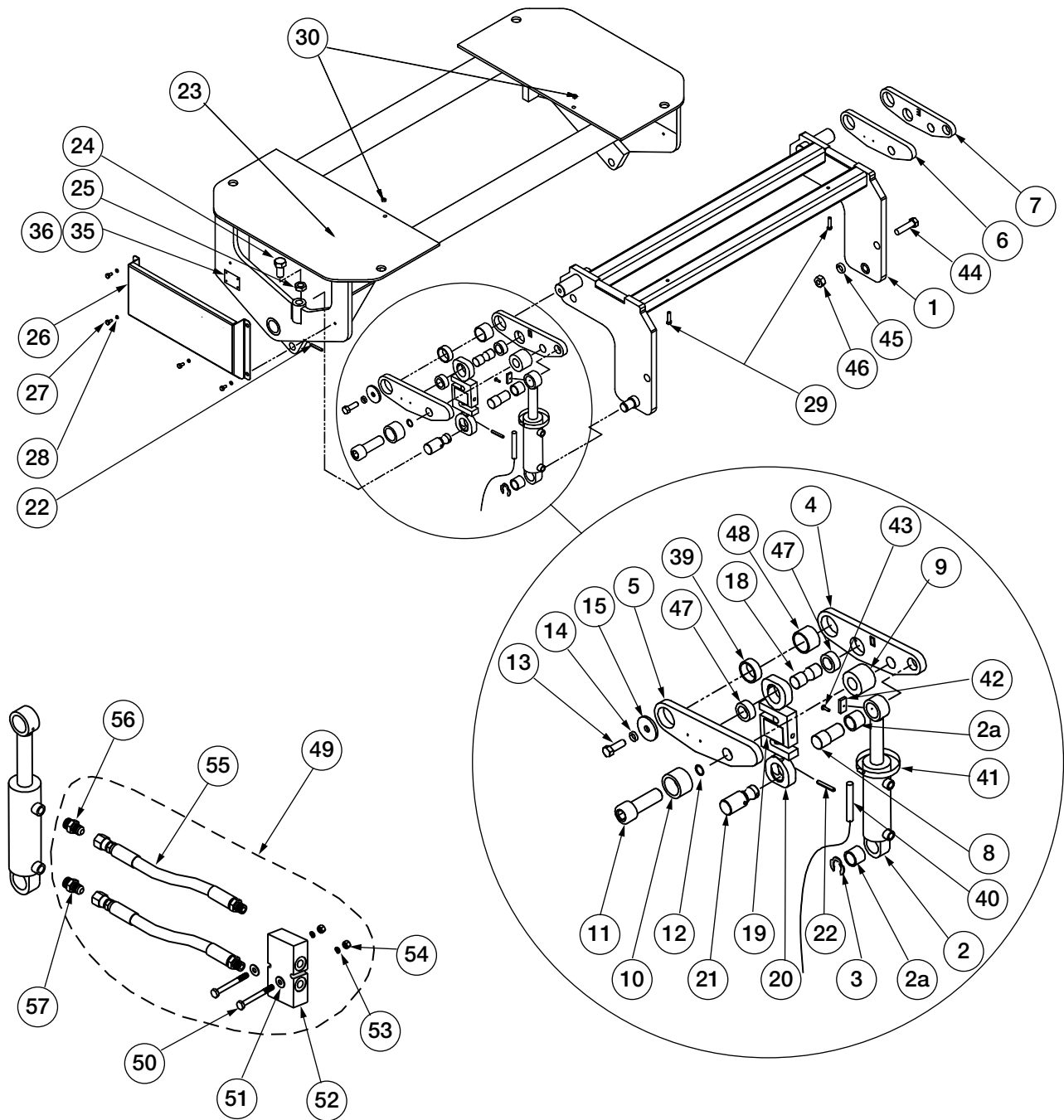


Note *The re-zero function cannot be used with five-point linear calibration.*

- If no other apparatus was used to hang the test weights during calibration, remove the test weights and press **up** to return to the *CALIBR* submenu.
 - 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, then press **down** to show the current zero value. Press the **Calibrate** softkey to adjust the zero and span calibration values. Press **enter** or **up** to return to the *CALIBR* submenu.
8. Press **up** to return to the *SCALES* menu, or press the **Save and Exit** softkey to exit setup mode.

4.0 Repair Parts

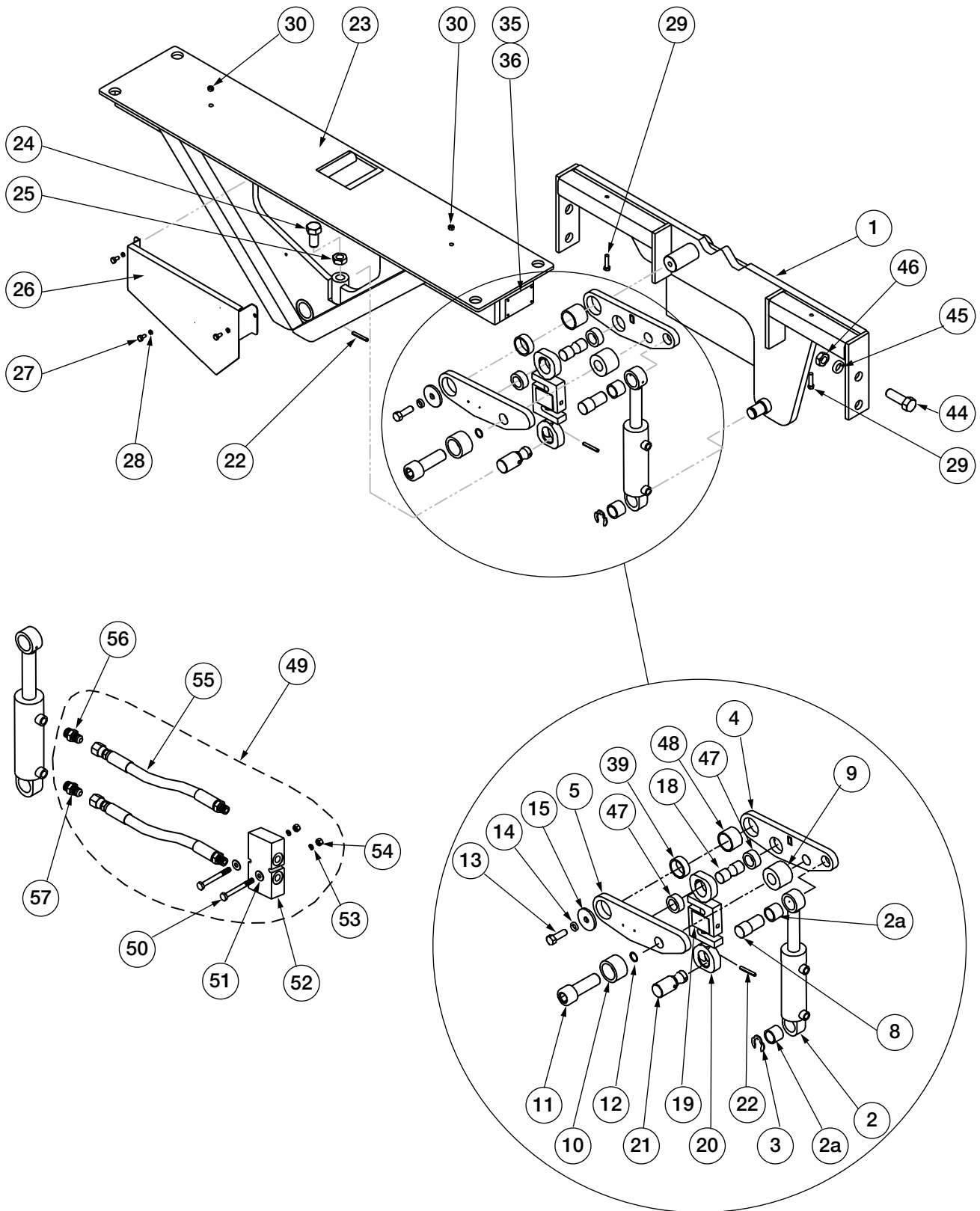
4.1 Double



Item	Part No.	Description	Qty
1	128592	Base ASSY,Double Low	1
2	127183	Cylinder,Hydraulic 1.75 x	2
2a	126801	Bushing,Oil Lite 1-1/4 x	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, 1-14UNSx3 Hex	2
12	126800	O-Ring,1 IN ID X 1-1/8 IN	2
13	14751	Bolt,1/2-13NCx1 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
	128641	LC with eye bolts 15K 14	4
19	21412	Load Cell,SBM RL20001-T10	2
20	127643	Eyebolt,Machined 15K 14	4
	127673	LC with eye bolts 10K MAS	4
19	21444	Load Cell,SBM RL20000B-	2
20	127163	Eyebolt,Machine 10K MAS	4
	128674	LC with eye bolts	4
19	21443	Load Cell,SBM RL20000B-5K	2
20	127163	Eyebolt,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 14	4
	126965	Pin,1/4 x 1-3/4 Slotted 10K MAS	4
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 3/4-10NC 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 4x3/8	2
39	126799	Bushing , Oil Lite 1.75" x 1.5" x 0.75"	1
40	127638	Sensor ASSY,OBS Alarm	1

Item	Part No.	Description	Qty
41	126840	Hose Clamp,No. 36 Band	1
42	127637	Kit,OBW Reed Switch with	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



Item	Part No.	Description	Qty
1	128659	Base Single Low Profile	1
2	127183	Cylinder,Hydraulic 1.75 x	2
2a	126801	Bushing,Oil Lite 1-1/4 x	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, 1-14UNSx3 Hex	2
12	126800	O-Ring,1 IN ID X 1-1/8 IN	2
13	14751	Bolt,1/2-13NCx1 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
		LC with eye bolts 15K 14	2
19	128969	Load Cell,S-Type 15K OIML	1
20	127643	Eyebolt,Machined 15K 14	2
		LC with eye bolts 10K MAS	2
19	21444	Load Cell,SBM RL20000B-	1
20	127163	Eyebolt,Machine 10K MAS	2
		LC with eye bolts	2
19	21443	Load Cell,SBM RL20000B-5K	1
20	127163	Eyebolt,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 14	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 3/4-10NC HEX	1
26	128661	Cell Cover,Single	1
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 1/8Ø	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	Kit,OBW Reed Switch with	1
43	126980	Screw,Machine 10-32 x 1/2	1

Item	Part No.	Description	Qty
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	
	127015	Cable Tie,7.5 inch Black	4

4.3 Linkage Disassembly and Assembly

To perform service on any of the scale parts (i.e. 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 key (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 (refer to parts drawing page)

1. Remove load cell cover bolts (20) and lock washers (21) with 7/16" wrench and remove load cell cover (37 or 44).
2. Remove retaining ring from lower cylinder pin (3) with flat head screwdriver.
3. There are two roll pins (17) inserted through the lower load cell pin (34). 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 (19) on lockdown bolt (18) and turn lockdown bolt in with 3/4" wrench.
5. Loosen socket head cap screw (10 and 11) with 3/4" Allen key. 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 (13), washer (15), and lock washer (14) with 3/4" wrench.
7. Remove socket head cap screw (10 and 11) and lift arm spacer (9).
8. Remove outer lift arm (5 or 7).
9. Remove upper load cell pin (31) and load cell assembly (32 and 33).
10. Remove upper cylinder pin (8) and hydraulic cylinder (1).
11. Remove inner lift arm (4 or 6).
12. Remove lower load cell pin (34) if required by removing the second roll pin (17) with roll pin punch and hammer.
13. Remove hydraulic fittings (55,56,57) if required with 11/16" and 5/8" wrenches.

Assembly Procedure (refer to parts drawings pages and)

1. Insert lower load cell pin (34) into lift plate (36 or 43) insert roll pin to hold the pin in place with roll pin punch and hammer.
2. Assemble inner lift arm (4 or 6) onto pivot pin on base (35 or 42).
3. Assemble hydraulic cylinder (1) onto lower cylinder pin on base (35 or 42).
4. Insert upper cylinder pin (8) through cylinder (1) into inner lift arm (4 or 6).
5. Assemble load cell assembly (32,33) onto lower load cell pin (34).
6. Apply a thin film of grease onto ends of upper load cell pin (31).
7. Insert upper load cell pin (31) through upper eyebolt (33) into inner lift arm (4 or 6).
8. Assemble outer lift arm (5 or 7) loosely onto the three pins (pivot, upper load cell, and upper cylinder).
9. Place lift arm spacer (9) between two lift arm plates and press outer lift arm fully onto the pins.
10. Insert cap screw (10,11) and start threads, *do not tighten*, with 3/4" Allen key.
11. Insert pivot bolt (13), washer (15) and lock washer (14) into pivot pin and tighten with 3/4" wrench.
12. Tighten cap screw (10,11) with 3/4" Allen key.
13. Turn out the lock down bolt (18) until cylinder is extended between 1/8" and 1/4" with 3/4" wrench. Tighten the jam nut (19).
14. Insert roll pin (17) through the lower load cell pin (34) to prevent the load cell assembly from jumping off the pin with roll pin punch and hammer.

15. Insert retaining ring (3) on lower cylinder pin with a hammer.
16. Assemble hydraulic fittings (55,56,57), if required, with 11/16" and 5/8" wrenches.
17. Attach load cell cover (37 or 44) with load cell cover bolts (20) and lock washers (21) with 7/16" wrench.

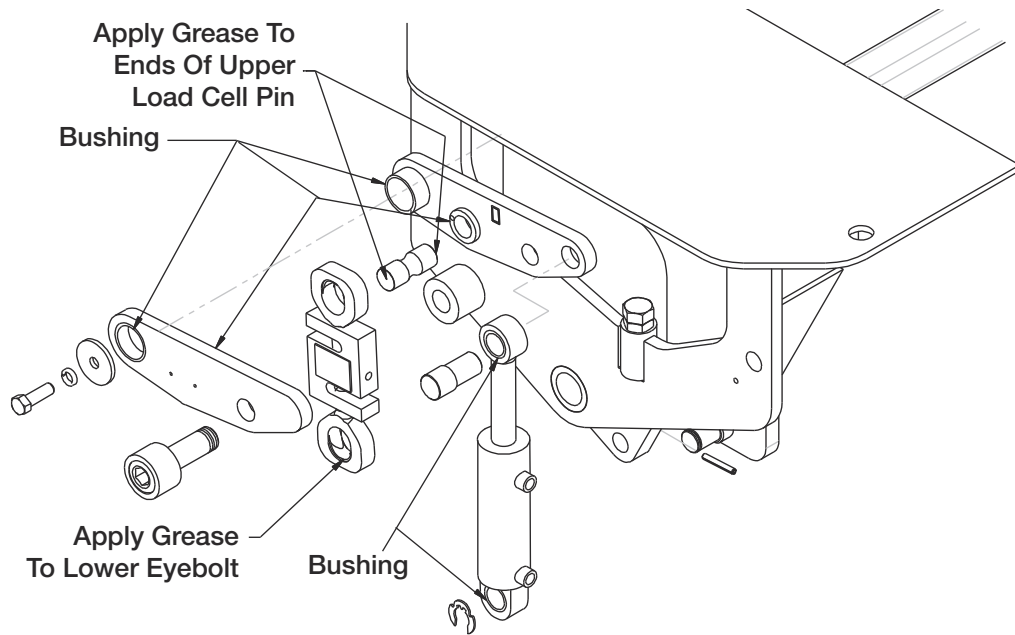


Figure 4-1. Linkage Assembly

Legal for Trade Inspection

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

1. Balance test (as described on page 16).
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 Check List

- 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 page Section 2.7)
- 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

Low Profile Weighing System 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. All systems and components are warranted against defects in materials and workmanship for one year.

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.

THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER RLWS NOR DISTRIBUTOR WILL, IN ANY EVENT, BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

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For More Information

Web Site

- Frequently Asked Questions (FAQs) at

<http://www.ricelake.com/faqs.aspx>

Contact Information

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Knowledgeable customer service representatives are available 6:30 a.m. - 6:30 p.m. Monday through Friday and 8 a.m. to 12 noon on Saturday. (CST)

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- Canadian and Mexican Customers 800-321-6703
- International 715-234-9171

Immediate/Emergency Service

For immediate assistance call toll-free 1-800-472-6703 (Canadian and Mexican customers please call 1-800-321-6703). If you are calling after standard business hours and have an urgent scale outage or emergency, press 1 to reach on-call personnel.

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