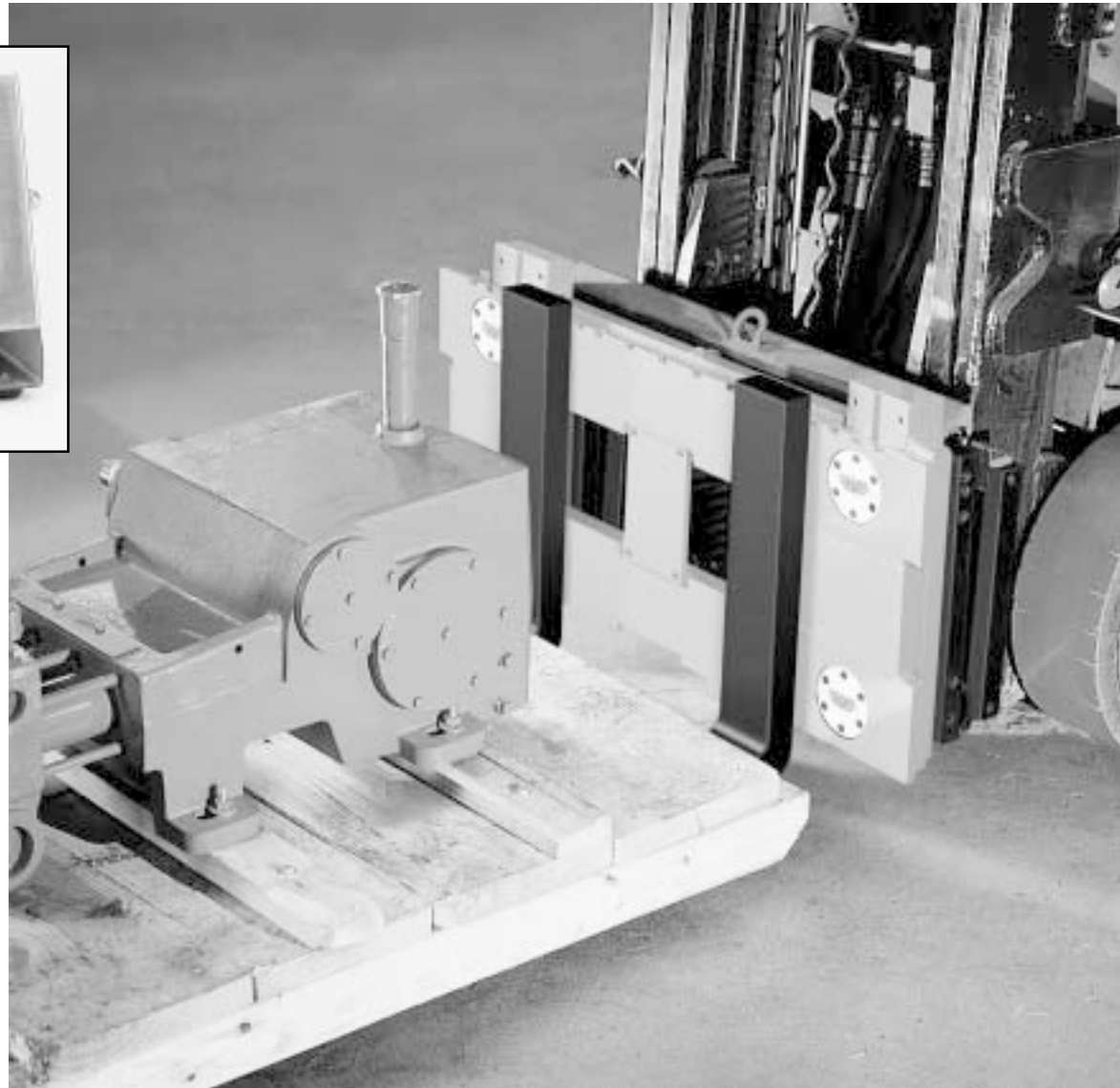


WEIGH-TRONIX



**Certified Lift Truck Scale with
SimulCast™ Instrument
Installation and Calibration Manual**

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Overview

Please, always keep safety first in your mind as you install your Weigh-Tronix scale and operate any lift truck. Take all necessary safety precautions as you install the Quik-Tach scale. This includes wearing safety shoes, protective eyewear, and using proper tools.

The Certifiable Quik-Tach Lift Truck Scale is shipped as a precalibrated scale system. Normally, these scales may be installed and expected to function within the requirements of a legal for trade scale by respanning the scale with an accurately known weight. However, if the scale is to be certified as legal for trade, as with all legal for trade scales, it must be tested to be sure it passes the tests required for such systems. If the scale fails to pass these tests within the acceptable margins, adjustments and calibrations must be made. The following steps will help the inexperienced technician minimize the effort to successfully install and calibrate the scale so that it will pass certification tests. Normal installation and testing should be accomplished in less than four hours.

Included in these instructions are

- Unpacking and Inspecting
- Installing the Quik-Tach carriage
- Routing the Signal Cable
- Mounting the SimulCast™ WI-130
- Making the Power Connections
- Calibration

Unpacking and Inspecting

- ☐ Inspect the shipping container as soon as it is received. If the container appears damaged, closely inspect the contents.
- ☐ Open the shipping container. Inside you will find the Quik-Tach carriage, WI-130 indicator with mounting bracket, interface cable, power cable, manuals, three metal shims of different sizes, six spacer plates, isomounts and their hardware, and necessary electrical connectors.
- ☐ Inspect the Quik-Tach carriage for damage. Examine the wiring and check the connections to the junction box.

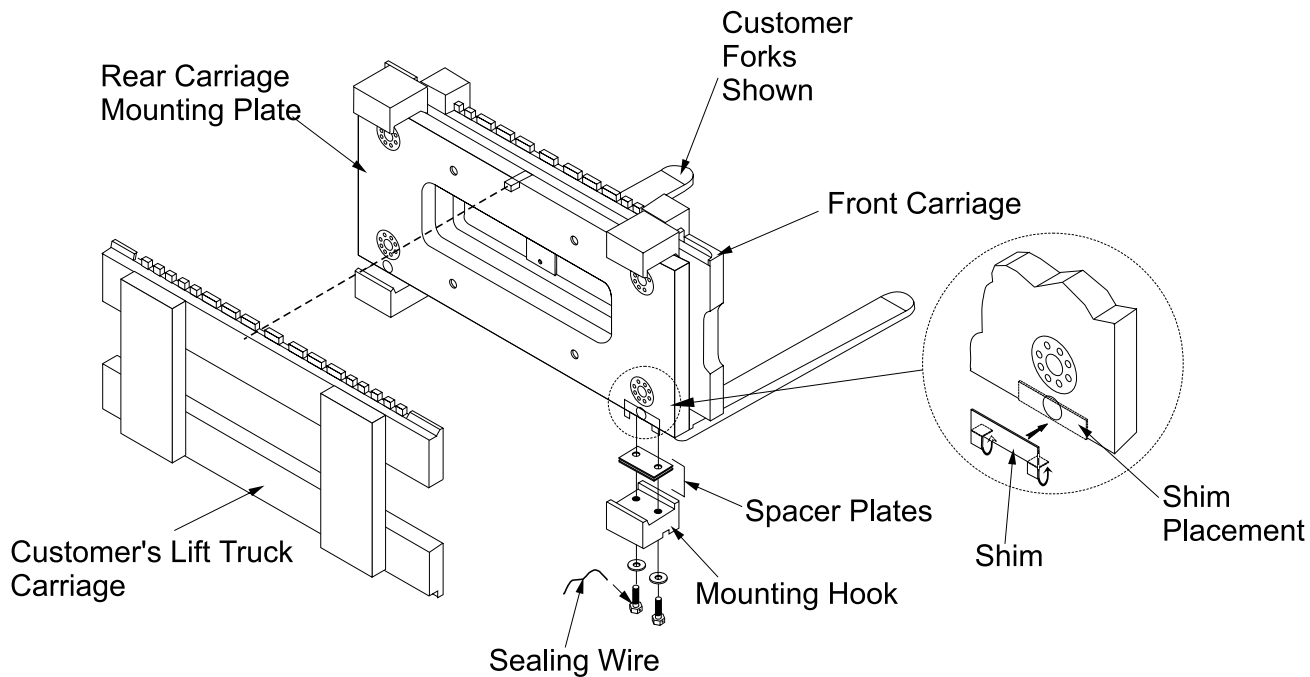


Figure 1
Mounting the scale

Installing the Quik-Tach Carriage

- ☐ Remove the customer's forks before you mount the Quik-Tach carriage. Check the forks for wear or damage and make any necessary repairs.
- ☐ Clean and inspect the customer's lift truck carriage. **Both the upper and lower sections of the carriage should be flat and not twisted or bent out of shape.** It is especially important that the upper carriage notches are not excessively worn.
- ☐ Remove the two mounting hooks and washers bolted to the bottom of the Quik-Tach carriage (see Figure 1). They secure the scale to the lift truck and will be reattached after the scale is properly positioned.
- ☐ Raise the Quik-Tach carriage to a vertical position on the pallet and drive the lift truck into position.
- ☐ Align the Quik-Tach carriage centering pin with the center notch in the customer's lift truck carriage. The rear face of the scale carriage must be against the customer's lift truck carriage and the top mounting blocks of the scale carriage must be over the top of the customer's lift truck carriage lip and seated firmly in place.
- ☐ Raise the carriage and back the lift truck away with the Quik-Tach scale in place.
- ☐ Raise the carriage to a convenient height for remounting the two mounting hooks. Make certain the customer's carriage is clean where the hooks will be positioned. Attach the mounting hooks and tighten the bolts. The torque specification for these bolts is 70 foot pounds. Thread sealing wire through the bolt heads to stop bolts from vibrating loose.

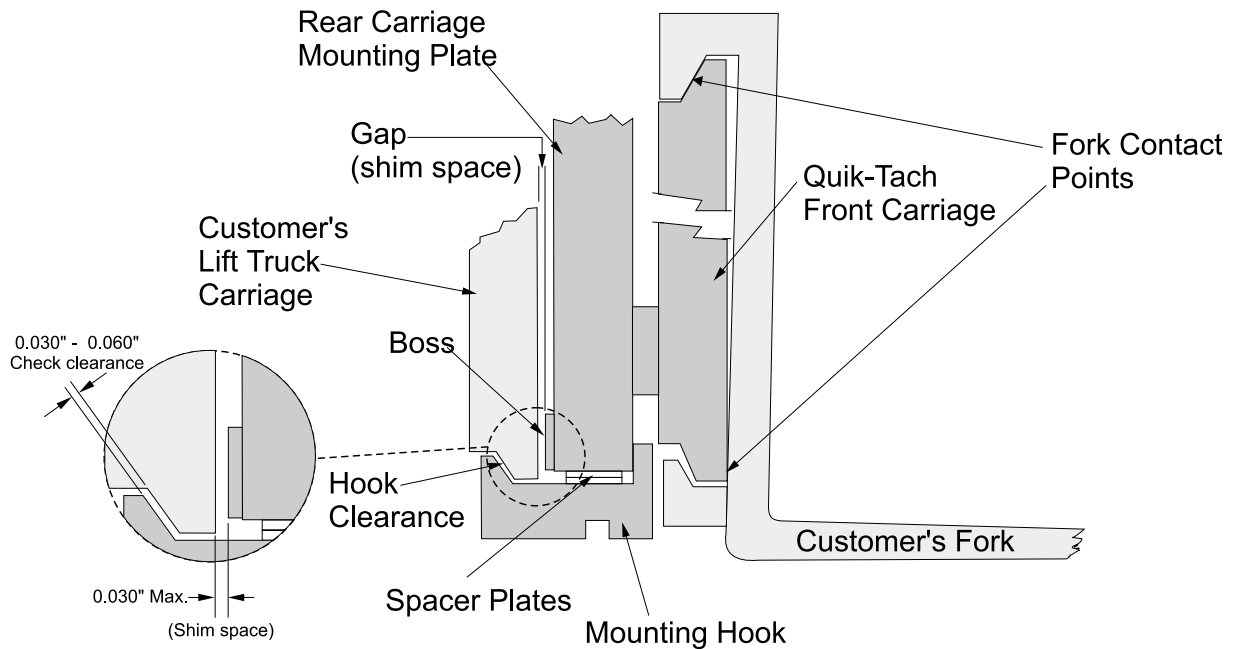


Figure 2



Attention

By adding the scale to your lift truck you reduce the lifting capacity of the truck. Owners should get a new maximum lifting plate from the lift truck supplier and mount it to the lift truck.

NOTE #1: (See Figure 2) Make sure the bosses on the Quik-Tach carriage make contact with the customer's lift truck when both forks are seated. If there is more than .030" gap between the Quik-Tach and the customer's lift truck carriage (see Figure 2) when the forks are seated, use the included shims as needed to close the gap on either end, then bend over the tabs to hold them in place as shown in Figure 1. There are three shim thicknesses. If you have to stack more than two shims on either end, your carriage is bent and needs to be fixed or replaced.

NOTE #2: There must be 0.030" to 0.060" space between the customer's lift truck carriage and the mounting hooks of the Quik-Tach scale. See Hook Clearance in Figure 2. These parts must not touch or the scale won't weigh correctly. Use the spacer plates as needed to be sure this space exists. Also be sure that the customer's lift truck forks contact the scale only at the positions shown in Figure 2. Repair or replace the forks if they are bent or have protrusions which contact the face of the scale.

- ☐ Mount the forks on the Quik-Tach scale carriage in the same way they attach to the regular lift truck carriage and move the forks into the positions they will be used during normal operation. Make sure all carriage components are firmly and safely in place.

Routing the Signal Cable

Place a bead of silicone (RTV) across the connector parts to reduce vibration effects.

The signal cable has two connectors, both of which are 12 pin.

- ☐ Position the cable between the uprights and over any side-shifter cylinder hoses.
- ☐ Plug the 12 pin connector into the junction box fitting and tighten the collar. Check for proper signal cable clearance.

Routing the interface cable up the center of the mast will prolong the cable life.

See Figure 3 for an illustration of routing the signal cable on one type of lift truck.

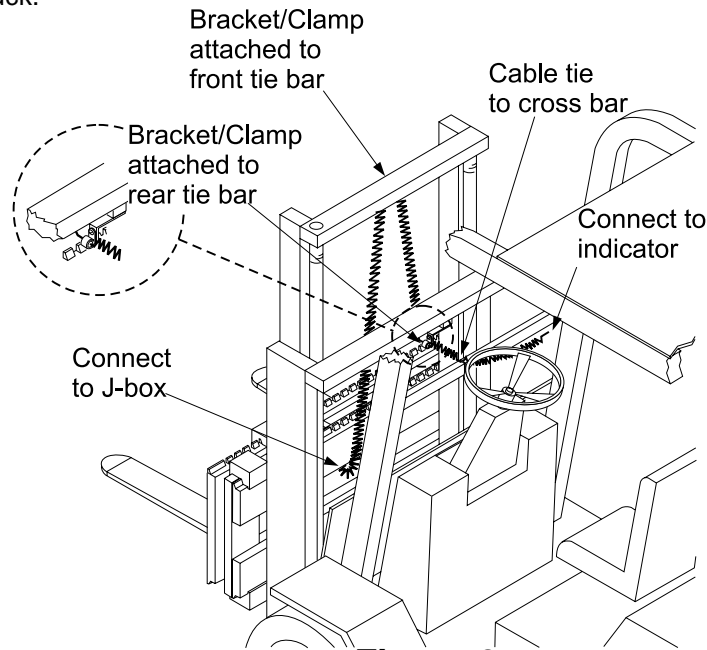


Figure 3
Sample routing of signal cable

Two mounting brackets are supplied with the signal cable kit.

- ☐ Mount the smaller bracket to the existing mounting block located under the **center** of the front tie bar. Mark and drill the two mounting holes in the bracket and cut off the excess length of the bracket. Bolt this bracket in place.
- ☐ With the forks in the fully lowered position, pull the signal cable towards this bracket and adjust the length until the slack is out of the cable. Place the clamp over this spot on the cable and attach it to the mounting bracket.
- ☐ Raise the forks to full height and back down again. Watch the cable as the carriage moves and adjust the cable length if necessary.
- ☐ To find the proper cable length for the second cable clamp position, again raise the forks to full height. Pull the cable towards the rear tie bar until the slack is gone. Place the cable clamp over this spot on the cable.
- ☐ Mount the second bracket to the existing mounting block under the **center** of the rear tie bar. Mark and drill the mounting hole in the second bracket and cut off the excess bracket length. Mount the bracket to the tie bar and secure the cable clamp to this second bracket.
- ☐ Check the cable as the carriage is moved fully up and down. Adjust the cable length if necessary.
- ☐ Tilt the uprights forward and back. Allow enough cable for this movement and secure the cable to the **center** of the crosspiece in front of the steering wheel with a cable tie. Route the cable out of the way towards the right leg of the overhead guard and cable tie it at this point.

Mounting the SimulCast™ WI-130 Indicator



Attention

Isomounts must be used to mount the indicator bracket.

Place Loctite® or silicone (RTV) on all fasteners to reduce vibration effects.

Inside the shipping box you will find a two-conductor power cable with connector, User's and Installation manuals, weight capacity stickers, isomounts and hardware.

- ☐ Determine the best location for the indicator. The indicator tilt position is adjustable. You may pick the best viewing angle for your operators now or after mounting the indicator.
- ☐ Hold the indicator bracket in position and mark the mounting holes onto the mounting surface. Centerpunch these locations.
- ☐ Drill and tap holes for 1/4" - 20 threads. Install the isomounts in these holes.
- ☐ Place the indicator bracket on these isomounts and install the supplied lock washers and nuts.
- ☐ Attach the 12-pin connector of the signal cable to J1 on the back of the indicator. Note the alignment pin and slot in the connectors. Plug them together and tighten the collar. See Figure 4 for pinout assignments.
- ☐ Tuck and tie the excess signal cable out of the way.

Making the Power Connections



Warning

Non-approved power connections may void warranty.

- ☐ Disconnect the ground wire from the battery terminal of the lift truck before performing any electrical work.
- ☐ Plug the 2-conductor power cable into J6 on the back of the indicator. See Figure 4 for pinout assignments.
- ☐ Route the power cable to the desired power source connection point. If possible, run the cable through existing holes and channels so that it will be out of the way and cannot be damaged by any of the truck's moving parts.
- ☐ Connect the white power cable as close as possible to the battery's positive voltage terminal without attaching it directly to the battery terminal. In other words, the first place the positive terminal is connected to is where you should tap in with the white power cable for the indicator.
- ☐ Connect the black ground cable as close as possible to the battery's negative terminal without attaching it directly to the battery. In other words, the first place the negative terminal is connected to is where you should tap in with the black ground cable for the indicator. The chassis may not provide the proper ground potential.
- ☐ Reconnect the battery terminal ground wire.
- ☐ Press any key to activate the SimulCast indicator.
- ☐ Raise the forks a few inches off the floor and zero the indicator by pressing the ZERO button. Place a known test weight on the forks and make sure the indicator displays the correct weight.

- ❑ Connect any other peripheral equipment you will be using to the back of the SimulCast™ WI-130. See Figure 5.

Your scale is now installed and ready for use. Lift trucks will experience a 12% to 14% reduction in lifting capacity with the Quik-Tach scale installed. Contact your lift truck representative for the new capacity of your lift truck and particular option setup.

If you have any problems during installation of your Quik-Tach lift truck scale, please contact your local Weigh-Tronix representative.

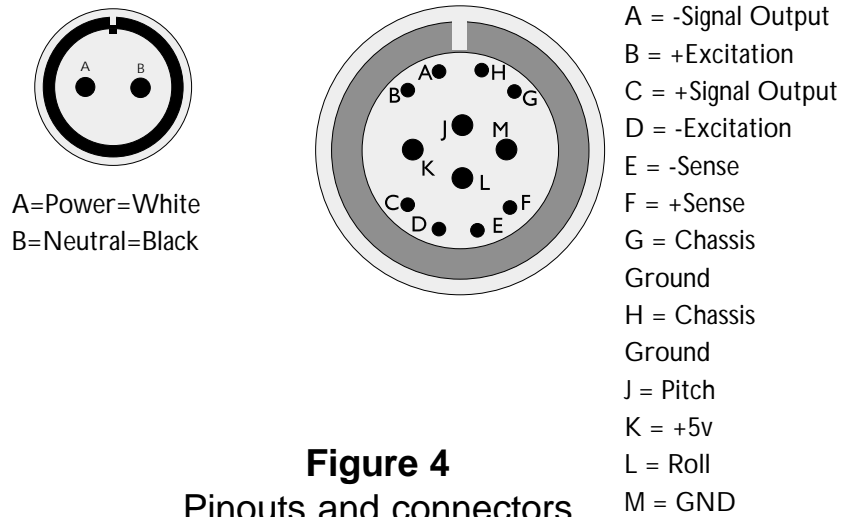


Figure 4
Pinouts and connectors

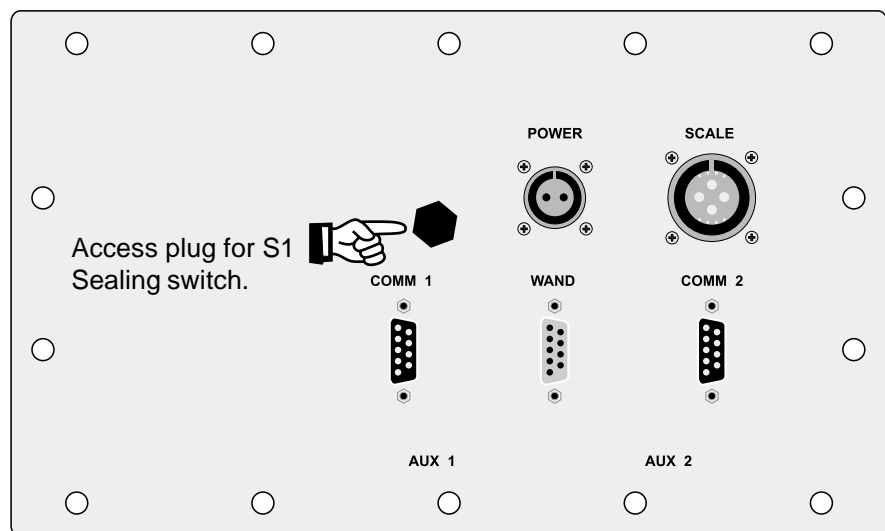


Figure 5
Connectors on the back of the SimulCast™ WI-130

Calibration

Unsealing the WI-130

You must key in the password within five seconds or the WI-130 returns to normal operation.

Legal for Trade Calibration Procedure

You may use as little as 1% of full capacity to span the system but Weigh-Tronix recommends a minimum of 25% be used. Using full capacity is ideal.

Any reference to Right or Left is done from the driver's point of view.

The WI-130 must be unsealed before you can attempt calibration. Follow these steps to unseal you indicator:

1. Access the User's menu by pressing and holding the **ESCAPE** key until the display prompts for a password. Key in your user's password factory default is 111) and press **ENTER**.
2. Press the **VIEW** softkey, then the **SEAL** softkey.
3. Press the SW1 switch behind the access plug on the back of the indicator to toggle the state from Sealed to Unsealed.
4. Press any key to return to the entry level, then press the **EXIT** softkey to return to normal weigh mode.

Enter the calibration mode by pressing and holding the **ESCAPE** key until the display asks for a password. Key in your calibration password (factory default is 30456) and press the **ENTER** key. If you enable **ANGLES** under the **CAPAC** (F1) softkey you can perform the *Legal for Trade Calibration Procedure* below. If you do not enable **ANGLES**, use the *Non-Legal for Trade Calibration Procedure* on page 10.

1. Place all deadload objects (pallets, chains, etc.) on the forks.
2. Press the **ZERO** key. . .
3. Press any key.
4. With Angles enabled, if you press the **SPAN** (F3) soft key, the display asks if you want to perform span or angle calibration. Press the **SPAN** (F1) or **ANGLE** (F5) soft key to choose which you want to calibrate. Steps 2-5 are for SPAN calibration and steps 9-18 are for ANGLE calibration.

Display will ask you to remove all weight (not your deadload) and press **ENTER**. The display will show zero.

5. If you press **SPAN**, you will be allowed to adjust the overall span of the WI-130. This operation should only be performed if the error following installation is uniform over all angles and is linear through the applied test weights. . .

The current span calibration weight is displayed.

6. Press **ENTER** to accept this weight or key in a new one and press **ENTER**. . .

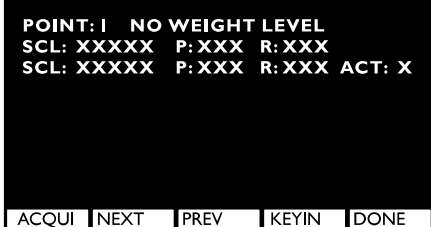
The display prompts you to apply the test weight load to the scale.

7. Apply the test weight load to the scale and press **ENTER**. . .

The indicator determines the span and tells you when it is done. Above the text, the display should show you the correct test weight. If not perform the span again.

8. Press any key to return to the CALIBRATE display.

9. If you press **ANGLE**, the following is displayed. . .



```
POINT: 1 NO WEIGHT LEVEL
SCL: XXXXX P: XXX R: XXX
SCL: XXXXX P: XXX R: XXX ACT: X

ACQUI NEXT PREV KEYIN DONE
```

The first line of text tells you which point you are acquiring data for. In this case it is NO WEIGHT LEVEL, which means there is no weight on the forks and they are level.

The second lines shows the current SCL (scale) raw counts, P (pitch) raw counts, and R (roll) raw counts. The third line shows the acquired values from the last calibration procedure. ACT, on the third line is the actual weight being used for this part of the calibration. It automatically starts at 0 weight.

Soft keys

ACQUI (F1) Stands for acquire. Press this to take sample calibration points at different weights and angles. There are 16 points to sample in angle calibration.

NEXT (F2) Press this key to move to the next sample point.

PREV (F3) Press this key to move to the previous sample point.

KEYIN (F4) This key is for future development.

DONE (F5) Press this key when you are done sampling all 16 points.

10. With no weight on the scale and the forks level, press the **ACQUI** (F1) softkey. . .

The following is displayed:



```
CALIBRATE

ACTUAL WEIGHT: 0_

BKSP ← -NEG
```

11. Key in the actual weight you are using for this part of the calibration. Zero weight is already displayed so press **ENTER** to accept. . .

The screen shown in step 9 is displayed except that the values in the third line now reflect the newly acquired values.

12. Press **NEXT** (F2) to go to the next calibration point. . .

POINT: 2 NO WEIGHT ROLL LEFT is displayed. See Table 1 below and *Appendix A* for tips on tipping your lifttruck.

Table 1
Inch Equivalent of Five Degrees

If your lift truck width is:	Five degrees is:
48 inches	4.2 inches
42 inches	3.7 inches
36 inches	3.2 inches
30 inches	2.6 inches
24 inches	2.1 inches

Here is a list of all 16 calibration points in the order they appear:

NO WEIGHT LEVEL
NO WEIGHT ROLL LEFT
NO WEIGH ROLL RIGHT
NO WEIGHT PITCH FWD
NO WEIGHT PITCH BACK
HALF WT. LEVEL
HALF WT. ROLL LEFT
HALF WT. ROLL RIGHT
HALF WEIGHT PITCH FWD
HALF WEIGHT PITCH BACK
FULL WT. LEVEL
FULL WT. ROLL LEFT
FULL WT. ROLL RIGHT
FULL WT. PITCH FWD
FULL WT. PITCH BACK
HALF WT. LEVEL

13. With no weight on the scale and the lifttruck tilted to the left approximately 5 degrees press the **ACQUI** (F1) softkey. . .

You will see the same display shown in step 10.

14. Repeat steps 11-13 while rolling or pitching the lifttruck as directed by the display.

15. When you have completed all the NO WEIGHT calibration points, the display asks for the HALF WT. LEVEL point. (See the list at left to see all the calibration points.) Use one half of the weight you want to use at full span.

For example, if you want to use 4000 lbs as your upper span test weight, use 2000 lbs for this part of the calibration.

Perform all five half weight calibration points. . .

The display asks for the FULL WT. LEVEL point.

16. Perform all five full weight calibration points using your full 4000 lbs (in this example).

- | | |
|--|---|
| 17. The indicator asks for one more calibration point—HALF WT. LEVEL. Acquire this last point then press the DONE (F5) key. . . | The display will ask if you are done. If you press YES , the display will ask if you want to PERFORM FIT? If you want to have the indicator fit these new calibration points to a new calibration setup, press YES . If you press YES, the display will eventually show the current weight on the scale and ask you to press any key to continue. |
| 18. Press any key. . . | Display returns to the CALIBRATE screen. |

Non-Legal for Trade Calibration Procedure

- | | |
|--|--|
| 1. Press the ZERO (F2) softkey. . . | The display asks you to remove all weight from the scale then press ENTER . |
| 2. Remove all weight from the scale and press the ENTER key. . . | After the indicator has calibrated the zero point, the display says DONE. |
| 3. Press ENTER . . . | The display returns to the CALIBRATE display. |
| 4. Press the SPAN (F3) soft key. | |
| 5. Key in the amount of weight you will use for calibration and press ENTER . . . | The display prompts you to apply the test weight load to the scale. |
| 6. Apply the test weight load to the scale and press ENTER . . . | The indicator determines the span and tells you when it is done. Above the text, the display should show you the correct test weight. If not perform the span again. |
| 7. Press any key to return to the CALIBRATE display. | |

When you make changes to the calibration of your system and press **EXIT** (F5) to leave the calibration setup, the display will always ask if you want to save the changes you have made. Press **YES** to save the changes and press **NO** to leave calibration without saving the changes you have made.

Corner Balancing the Weigh Bars



Caution

DO NOT ADJUST THE PITCH AND ROLL POTS! These are factory set and should be left alone.

Calibration of the QTLTSC system consists of two processes; cornering and calibration of the system. Cornering makes the Weigh Bars work together and is usually not required unless you replace a Weigh Bar or junction box. Calibration of the system was covered in the previous pages of this manual. This section covers cornering the Weigh Bars.

Below are instructions for calibrating the J-box shown in Figure 7. To access the junction box, remove the protective plate in the center of the scale. Remove the sealing wire and the two screws fastening the access cover.

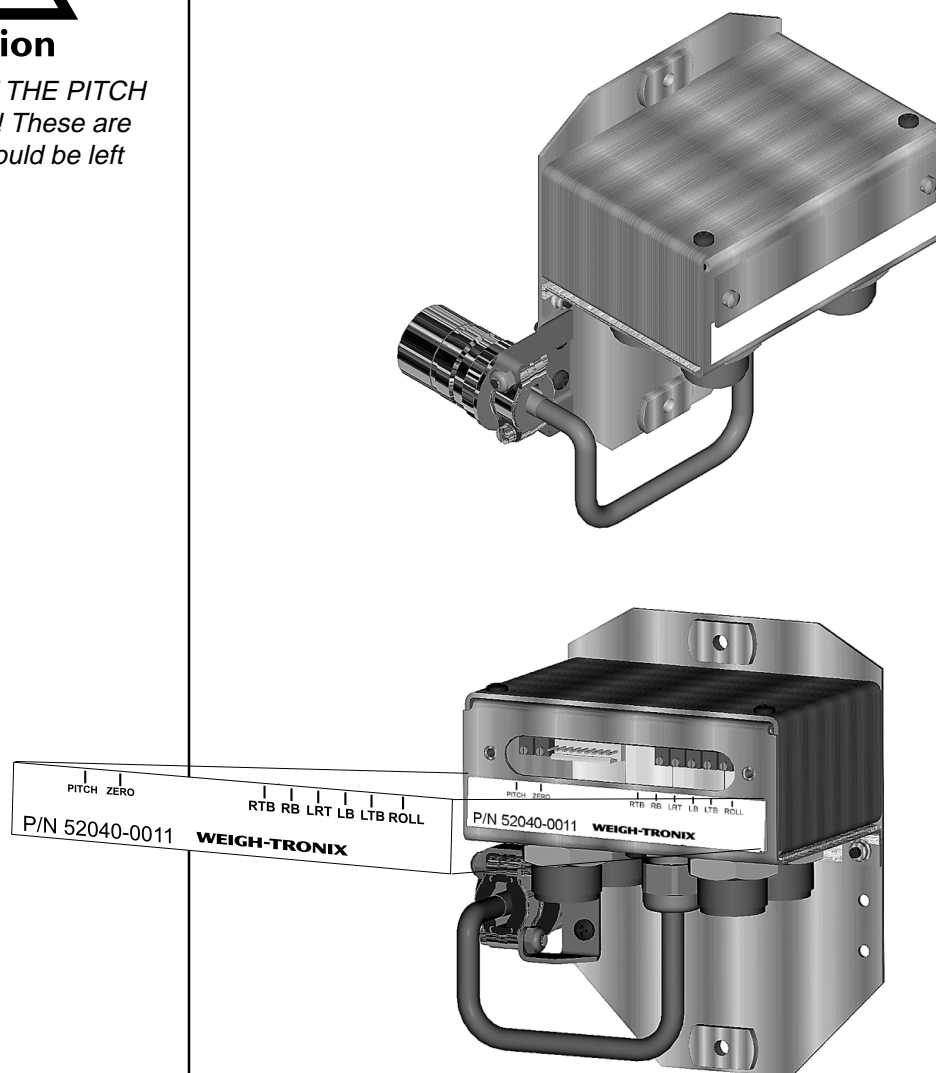


Figure 7
J-box

Trim Potentiometer Adjustment

*The right fork and left forks are those that are on the right and left **when you are sitting in the lift truck seat.***

Letters (LRT, RTB, etc.) refer to the potentiometer labels on the J-Box.

*0.15% of 1000 lbs = 1.5 pounds
0.15% of 2000 lbs = 3 pounds
0.15% of 3000 lbs = 4.5 pounds
0.15% of 4000 lbs = 6 pounds
0.15% of 5000 lbs = 7.5 pounds*

*0.05% of 1000 lbs = 0.5 pounds
0.05% of 2000 lbs = 1 pound
0.05% of 3000 lbs = 1.5 pounds
0.05% of 4000 lbs = 2 pounds
0.05% of 5000 lbs = 2.5 pounds*

A zero shift will occur whenever any of the potentiometers are adjusted. Remove all weight from the forks and zero the indicator after making any adjustments.

Prior to beginning any adjustments, obtain a 42", square, heavy duty pallet that will support the weights you will be using during the calibration process. To exercise the system, it is recommended that you place the pallet and weights on the lift truck and drive it around. Once you start this procedure, do not move the lift truck to another location until the procedure is completed.

1. Set the WI-130 indicator to read in one pound divisions.
2. Set the forks directly over the Weigh Bars™. Place the cornering weight (recommend 50% of capacity) on each of the four corners of the pallet one at a time and record the weight of each location.
3. Starting with the fork that has the largest difference between front and rear weight readings, adjust the trim balance (RTB for right trim balance and LTB for the left trim balance) to reduce the difference to less than 0.15% of the cornering weight you are using. See *Guidelines for Adjusting the Trim Potentiometers* below to determine which way to turn the potentiometer.
4. Switch to the other fork. Adjust the trim balance for that fork to reduce the difference between front and rear weight readings to less than 0.15% of the cornering weight you are using.
5. Place the cornering weight on the center of each fork and record the weight. Adjust the left-right balance (LRT) until the difference between these readings is less than 0.15% of the cornering weight you are using.
6. Repeat steps 3 through 5, but reduce the allowable difference to 0.05% of the cornering weight you are using.

Guidelines for Adjusting the Trim Potentiometers

(refer to Figure 7 for potentiometer location)

- The right trim balance (RTB) reduces the difference in weight readings on the right fork. For example, if the weight reading on the end of the right fork is less than the reading at the base of the right fork, slightly turn the RTB clockwise.
- The left trim balance (LTB) reduces the difference in weight readings on the left fork. For example, if the weight reading on the end of the left fork is less than the reading at the base of the left fork, slightly turn the LTB clockwise.
- The left-right trim (LRT) reduces the difference in weight readings between the left and right forks. For example, if the weight reading of the left fork is less than the reading of the right fork, turn the LRT clockwise.

Balance Potentiometer Adjustment

*The right fork and left forks are those that are on the right and left **when you are sitting in the lift truck seat.***

*0.15% of 1000 lbs = 1.5 pounds
0.15% of 2000 lbs = 3 pounds
0.15% of 3000 lbs = 4.5 pounds
0.15% of 4000 lbs = 6 pounds
0.15% of 5000 lbs = 7.5 pounds*

*0.05% of 1000 lbs = 0.5 pounds
0.05% of 2000 lbs = 1 pound
0.05% of 3000 lbs = 1.5 pounds
0.05% of 4000 lbs = 2 pounds
0.05% of 5000 lbs = 2.5 pounds*

A zero shift will occur whenever any of the potentiometers are adjusted. Remove all weight from the forks and zero the indicator after making any adjustments.

The following directions will enable you to adjust the scale so that it is insensitive to changes in fork position.

1. Place the cornering weight (recommend 50% of capacity) on the center of the right fork and record the weight. Move the right fork in six inches. Once again, place the weight on the center of the right fork and record the weight. Move the right fork out six inches so that it is in its original position.
2. Place the cornering weight on the center of the left fork and record the weight. Move the left fork in six inches. Once again, place the weight on the center of the left fork and record the weight. Move the left fork out six inches to its original position.
3. Starting with the fork that has the largest difference in weight readings between the two positions, adjust the balance potentiometer (RB or LB) to reduce the difference to less than 0.15% of the cornering weight you are using. See *Guidelines for Adjusting the Balance Potentiometers* below to determine which way to turn the potentiometer.
4. Switch to the other fork. Adjust the balance potentiometer (RB or LB) to reduce the difference between the two readings to less than three pounds.
5. Repeat steps three and four, but reduce the allowable difference to 0.05% of the cornering weight you are using.
6. Adjusting the balance potentiometers may cause errors in the cornering. You can correct these errors by repeating the steps listed under *Guidelines for Adjusting the Trim Potentiometers*. If large adjustments are necessary, the balance potentiometers may need to be readjusted by following the steps under *Balance Potentiometer Adjustment*.

Guidelines for Adjusting the Balance Potentiometers

(refer to Figure 7 for potentiometer location)

- The right balance potentiometer (RB) reduces the weight reading difference between the two positions of the right fork. For example, if the weight reading when the right fork is moved in six inches is less than the reading when the fork is directly over the Weigh Bars™, turn the right balance potentiometer (RB) clockwise.
- The left balance potentiometer (LB) reduces the weight reading difference between the two positions of the left fork. For example, if the weight reading when the left fork is moved in six inches is less than the reading when the fork is directly over the Weigh Bars™, turn the left balance potentiometer (LB) counterclockwise.

Final Preparation for Use of the WI-130

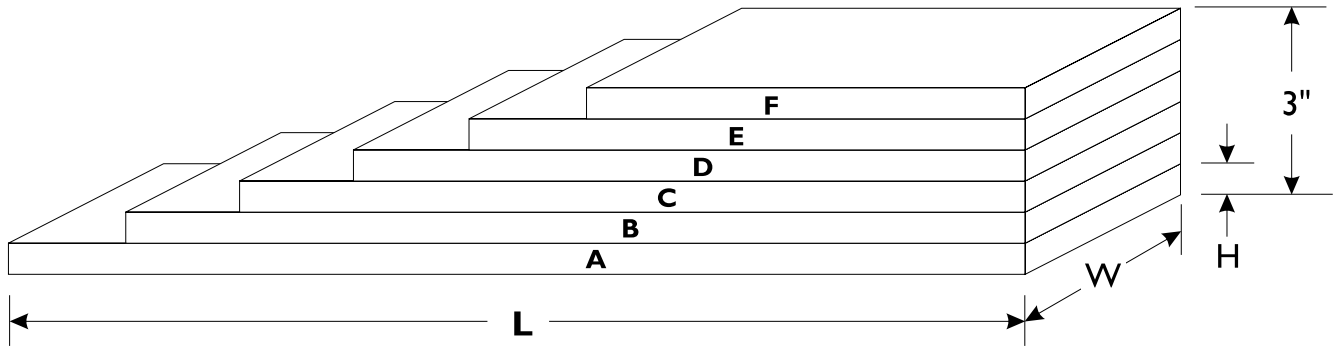
Replace the cover on the J-box and install a sealing wire. Use Loctite® on the bolts that hold the protective cover in the center of the scale.

Before placing the WI-130 into service collecting data you must enter some initial information. Follow the steps in the *User's Manual* and enter data into the following operational fields:

- Company
- Address
- Towmotor ID number
- Scale ID number
- Time
- Date
- Accuracy weight ID number
- Accuracy weight amount

Appendix A: Making a Ramp for Tilting the Lift Truck

1. With plywood, build two ramps, following the diagram below.
2. Nail them together.



Board	H (in inches)	W (in inches)	L (in inches)
A	0.5	8	24"
B	0.5	8	22"
C	0.5	8	20"
D	0.5	8	18"
E	0.5	8	16"
F	0.5	8	14"

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