

Model WI-125 for QTLTSC Lift Truck Systems Calibration Procedures (Class II & III)

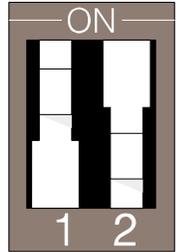
Your lift truck system has been factory calibrated and should be fully functional when you receive it. However, if you find that your system needs recalibration, this document details the necessary procedures.

Sealing the Indicator

Complete the physical sealing of the unit by using a sealing wire and the screws on the outside of the enclosure.

S1-2 is not functional.

The WI-125 can be sealed. If sealed, no configuration items can be changed in the configuration menu. Seal the unit by placing switch S1-1 in the OFF position. Unseal the unit by placing S1-1 in the ON position. Remove the front panel of the indicator to gain access to switch S1-1. The switch is located near the bottom corner of the PC board behind the display and looks like the diagram at right.



Entering the Configuration Mode to Calibrate the System

*While in the ACQUIRE mode, the power cable **must** always be hooked up to a hot line or data acquired will be lost. If you are running the lift truck during calibration do not turn off the lift truck until calibration is completely done.*

Calibration of the QTLTSC system consists of two processes; cornering and calibration of the system. Cornering makes the Weigh Bars work together. Calibration of the system makes the indicator work with the scale. **If the indicator provides linear incorrect readings you need only perform a span adjustment. See the *Spanning Adjustment* section on page 5.** A total system calibration is done by acquiring data points. Acquiring data points means loading the scale with different test weights, tilting the unit to different angles and telling the indicator what weight is on the scale at each tilt position. The indicator then fits these data points into its operation.

To calibrate your system you must enter the Configuration Menu. Follow the steps on the following pages to enter the Configuration Menu, corner the Weigh Bars and calibrate the system.

1. While in Gross Weighing Mode with the **unit unsealed**, press the up arrow key two times. The number **1** should appear on your display.
2. With the number **1** displayed, press and hold the **MENU** key until **SET UP** is displayed.

NOTE: DO NOT let go of the **MENU** key until **SET UP** is displayed or else **LIGHT** will be displayed. If this occurs, press the **G/N** key to return to Weighing Mode and begin again at Step 1.

3. Press **MENU** to display **ADJUST**.
4. Press **SELECT** to display **ACQUIRE**.
5. You are now in the Configuration Menu. To move around within the Configuration Menu follow the instructions printed in the box in Figure 1. Specific instructions for cornering and acquiring data points are detailed on the following pages.

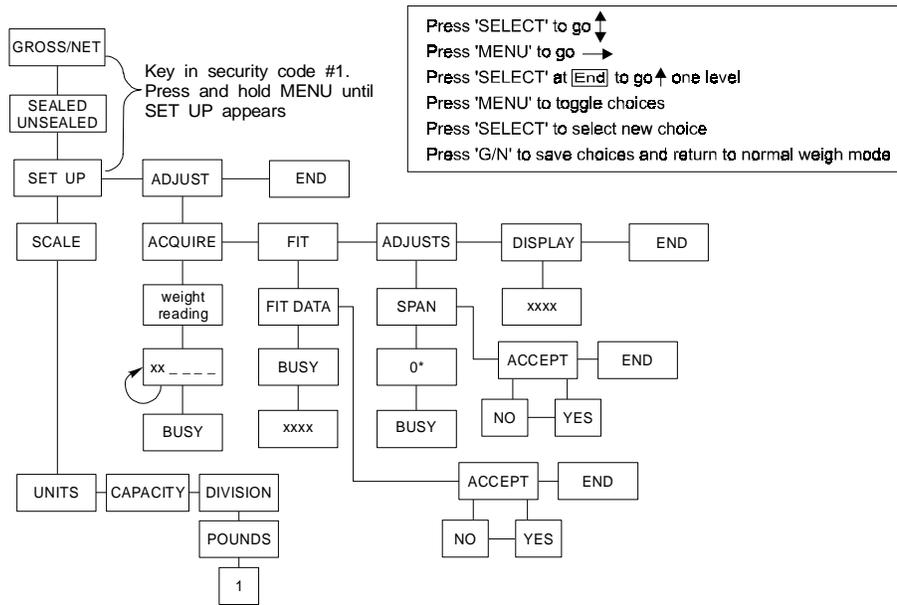


Figure 1
Configuration Menu Guide

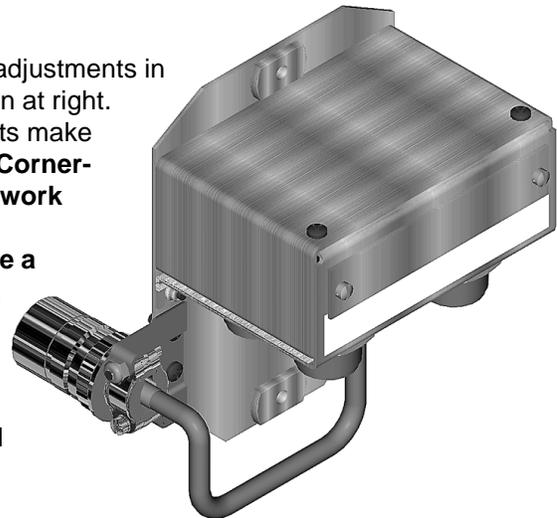
J-Box Information



Caution

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

You make trim and balance adjustments in the J-box. The J-box is shown at right. Trim and balance adjustments make up the cornering procedure. **Cornering makes the Weigh Bars work together and is usually not required unless you replace a Weigh Bar or junction box.**



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.

Trim, balance and calibration (acquiring data points) are covered in the following sections.

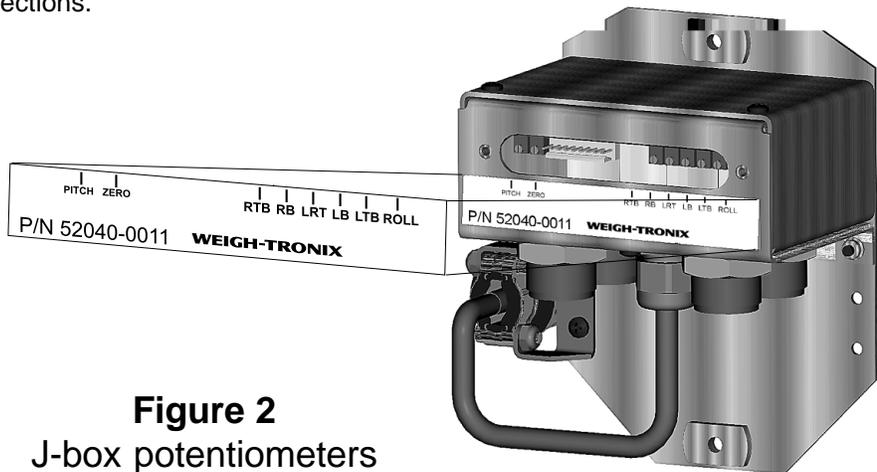


Figure 2
J-box potentiometers

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
0.15% of 6000 lbs = 9 pounds
0.15% of 7000 lbs = 10.5 pounds
0.15% of 8000 lbs = 12 pounds
0.15% of 9000 lbs = 13.5 pounds
0.15% of 10000 lbs = 15 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
0.05% of 6000 lbs = 3 pounds
0.05% of 7000 lbs = 3.5 pounds
0.05% of 8000 lbs = 4 pounds
0.05% of 9000 lbs = 4.5 pounds
0.05% of 10000 lbs = 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-125 indicator to read in one pound divisions by following the steps shown in Figure 1. **Remember to reset divisions to a certifiable increment when finished.**
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 2 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
0.15% of 6000 lbs = 9 pounds
0.15% of 7000 lbs = 10.5 pounds
0.15% of 8000 lbs = 12 pounds
0.15% of 9000 lbs = 13.5 pounds
0.15% of 10000 lbs = 15 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
0.05% of 6000 lbs = 3 pounds
0.05% of 7000 lbs = 3.5 pounds
0.05% of 8000 lbs = 4 pounds
0.05% of 9000 lbs = 4.5 pounds
0.05% of 10000 lbs = 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 .15%.
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 affect the cornering. You can correct these differences 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 2 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.

Spanning Adjustment for an Existing Calibration

It is best to use full capacity weight when calibrating. A minimum of 25% of capacity is recommended.

Span Adjustment



This spanning procedure applies only to those systems that already have the 16 data points in memory.

Respanning may save time if your system is simply out of tolerance and the 16 step data acquisition is not necessary. Use this spanning procedure if weight value remains the same when the system is tipped but the weight is inaccurate.

1. Lift a load near the capacity of the lift truck several times to exercise the scale.
2. Check the scale span by lifting an accurately known load with the lift truck. If the weight reading is correct, go to Step 3.

If the weight reading is incorrect, the scale should be respanned by following these steps:

- a. Press the round, yellow **UP ARROW** key twice—"1" is displayed
- b. Press and hold the **MENU** key until "**set up**" appears

- c. Press **MENU** again—"adjust" appears

- d. Press **SELECT**—"acquire" appears

- e. Press **MENU**—"fit" appears

- f. Press **MENU**—"adjusts" appears

- g. Press **SELECT**—"span" appears.

- h. Press **SELECT** again—a number appears and you may now enter in the known weight of your test load using the yellow **UP ARROW** and **UNITS** keys. Follow the example below:

To enter the weight of 4500:

1. Press the yellow **UP ARROW** key 4 times—**4** is displayed
2. Move over the 4 by pressing the **UNITS** key—**40** is now displayed
3. Press the yellow **UP ARROW** key 5 times—**45** is displayed
4. Move over the 45 by pressing the **UNITS** key—**450** is now displayed
5. Since the third number is a zero, press the **UNITS** key to accept it—**450** is now displayed
6. Move over the 450 by pressing the **UNITS** key—**4500** is now displayed

- i. After keying in your load weight, press **SELECT**—"busy" is displayed momentarily, followed by "**span**"

- j. Press **MENU**—"accept" is displayed

- k. Press **SELECT**—"no" is displayed

- l. Press **MENU**—"yes" is displayed

- m. Press **SELECT**—"accept" is displayed

- n. Press **MENU**—"end" is displayed

- o. Press the **G/N** key to return to weighing mode. Calibration is complete.

3. Unload the scale, zero the indicator by pressing the **ZERO** key and weigh the known weight again. If the weight reading is still incorrect, respan the indicator by following steps "2a" through "2o".
4. Check the scale for load shift sensitivity (cornering error).
 - a. Lift one-half of net capacity in one quadrant of the pallet and record the weight.
 - b. Move the weight to each of the other four quadrants, recording the displayed weight each time.
 - A new, certifiable installation should have the same weight reading in every corner of the pallet.
 - An older installation should have scale readings within 5 lbs in each corner.
 - c. If the scale requires cornering, refer to the *Trim* and *Balance* sections of this manual.
5. Check the scale for tilting sensitivity
 - a. Lift a known weight (at least half of net capacity) with the scale,
 - b. Tilt the scale through the expected range of operation. The scale should be allowed to settle in several tilted positions.
 - c. If the scale requires cornering, refer to the *Trim* and *Balance* sections of this manual.
6. Check the scale for linearity.
 - a. Zero the scale and lift one-half of net scale capacity.
 - b. Load additional known weights until the total weight is near net scale capacity.
 - c. If the scale does not accurately display both weightments (within 5 lbs at full capacity), refer to the *Trim* and *Balance* sections of this manual.

Making a Ramp

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

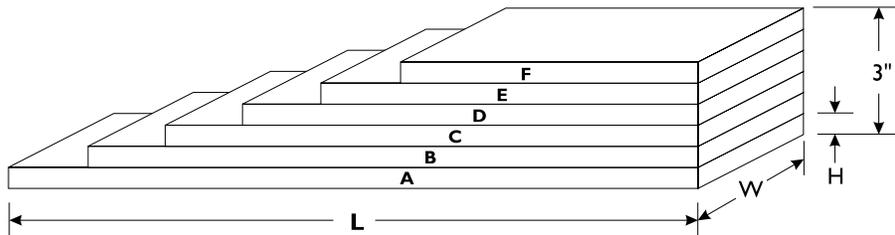


Table 3
Inch Equivalent of Five Degrees

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

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"

Step-by-Step Instructions for Acquiring Data Points

See Figure 1 for configuration menu guide.

Configure indicator to display 1 pound increments.

See Making a Ramp for tilting the lift truck accurately. To determine the inch equivalent of five degrees, see Table 1.

Forks **must** be tilted between five and ten degrees. If this is impossible to accomplish by tilting the forks alone, tilt the entire lift truck.

Be careful not to exceed lift truck rated lifting capacity.

The following checklist is the 16 step procedure for acquiring data points. Detailed instructions follow below.

Acquiring Data Points Checklist

- Scale at zero, lift truck level
- Scale at zero, lift truck's right side elevated
- Scale at zero, lift truck's left side elevated
- Scale at zero, forks tilted forward
- Scale at zero, forks tilted backward
- With a weight of 30% to 50% new capacity on scale, lift truck level
- With a weight of 30% to 50% new capacity on scale, lift truck's right side elevated
- With a weight of 30% to 50% new capacity on scale, lift truck's left side elevated
- With a weight of 30% to 50% new capacity on scale, forks tilted forward
- With a weight of 30% to 50% new capacity on scale, forks tilted backward
- With a weight of 60% to new capacity* on scale, lift truck level
- With a weight of 60% to new capacity* on scale, lift truck's right side elevated
- With a weight of 60% to new capacity* on scale, lift truck's left side elevated
- With a weight of 60% to new capacity* on scale, forks tilted forward
- With a weight of 60% to new capacity* on scale, forks tilted backward
- With a weight of 30% to 50% new capacity on scale, lift truck level

* Refer to Figure 3, "Recalculating Lift Truck Capacity" on the next page for the new capacities.

- 1a. Level the forklift. With only a pallet on the scale and **ACQUIRE** displayed on the WI-125, press **SELECT**. Once the number on the scale is steady, press **SELECT** again. **01** is displayed.
- 1b. Scroll in **0** and press **SELECT**. **bUSy** is displayed briefly and then **ACQUIRE** is redisplayed.
- 2a. Raise the right side of the lift truck between five and ten degrees. Press **SELECT**. Once the number on the scale is steady, press **SELECT** again. **02** is displayed.
- 2b. Press **SELECT**. **bUSy** is displayed briefly and then **ACQUIRE** is redisplayed.
- 3a. Raise the left side of the lift truck between five and ten degrees. Press **SELECT**. Once the number on the scale is steady, press **SELECT** again. **03** is displayed.
- 3b. Press **SELECT**. **bUSy** is displayed briefly and then **ACQUIRE** is redisplayed.

For steps 7 and 8, make sure to use an adequate jack placed under the side of the lift truck to safely tilt it.

You may view or change any or all of your data points by following these steps.

To view the data points:

1. From the ACQUIRE display, press SELECT, then press SELECT.

The first available data point will appear followed by an underscore (_).

2. Press the MENU key.

END will be displayed.

3. Press the MENU key.

The first data point and the entered value will be displayed. Press MENU repeatedly to see the consecutive data points.

To change a data point:

1. From point 3 above, scroll in a new value. Then press SELECT.

The new value is accepted and the next data point appears.

Escape from this procedure by pressing MENU until END is displayed, then press SELECT.

Remember to refit the data if you have changed any data points.

- 4a. Tilt forks forward between five and ten degrees. Press **SELECT**. Once the number on the scale is steady, press **SELECT** again. **04** is displayed.
- 4b. Press **SELECT**. **bUSy** is displayed briefly and then **ACQUIRE** is redisplayed.
- 5a. Tilt forks backward between five and ten degrees. Press **SELECT**. Once the number on the scale is steady, press **SELECT** again. **05** is displayed.
- 5b. Press **SELECT**. **bUSy** is displayed briefly and then **ACQUIRE** is redisplayed.
- 6a. With the lift truck and forks level, place $\frac{1}{2}$ of new capacity on the scale. Press **SELECT**. Once the number on the scale is steady, press **SELECT** again. **06** is displayed.
- 6b. Scroll in the amount of weight used. Press **SELECT**. **bUSy** is displayed briefly and then **ACQUIRE** is redisplayed.
- 7a. Raise right side of the lift truck between five and ten degrees. Place $\frac{1}{2}$ of new capacity on the scale. Press **SELECT**. Once the number on the scale is steady, press **SELECT** again. **07** is displayed.
- 7b. Scroll in the amount of weight used. Press **SELECT**. **bUSy** is displayed briefly and then **ACQUIRE** is redisplayed.
- 8a. With weight on the scale, raise left side of the lift truck between five and ten degrees. Press **SELECT**. Once the number on the scale is steady, press **SELECT** again. **08** is displayed.
- 8b. Press **SELECT**. **bUSy** is displayed briefly and then **ACQUIRE** is redisplayed.
- 9a. Leave the weight on the scale and tilt forks forward between five and ten degrees. Press **SELECT**. Once the number on the scale is steady, press **SELECT** again. **09** is displayed.
- 9b. Press **SELECT**. **bUSy** is displayed briefly and then **ACQUIRE** is redisplayed.

- 10a. Leave the weight on the scale and tilt forks backward between five and ten degrees. Press **SELECT**. Once the number on the scale is steady, press **SELECT** again. **10** is displayed.
- 10b. Press **SELECT**. **bUSy** is displayed briefly and then **ACQUIRE** is redisplayed.
- 11a. With the lift truck and forks level, place a weight of between 60% and new capacity (see *Calculating New Lift Capacity*) on the scale. Press **SELECT**. Once the number on the scale is steady, press **SELECT** again. **11** is displayed.
- 11b. Scroll in the amount of weight used. Press **SELECT**. **bUSy** is displayed briefly and then **ACQUIRE** is redisplayed.
- 12a. Raise right side of the lift truck between five and ten degrees. Place a weight of between 60% and new capacity on the scale. Press **SELECT**. Once the number on the scale is steady, press **SELECT** again. **12** is displayed.
- 12b. Scroll in the amount of weight used. Press **SELECT**. **bUSy** is displayed briefly and then **ACQUIRE** is redisplayed.
- 13a. Leave the weight on the scale and raise left side of the lift truck between five and ten degrees. Press **SELECT**. Once the number on the scale is steady, press **SELECT** again. **13** is displayed.
- 13b. Press **SELECT**. **bUSy** is displayed briefly and then **ACQUIRE** is redisplayed.
- 14a. Leave the weight on the scale and tilt forks forward between five and ten degrees. Press **SELECT**. Once the number on the scale is steady, press **SELECT** again. **14** is displayed.
- 14b. Press **SELECT**. **bUSy** is displayed briefly and then **ACQUIRE** is redisplayed.

In step 19, if the you get the number 0, check your data points.

- | | |
|---|---|
| 15a. Leave the weight on the scale and tilt forks backward between five and ten degrees. Press SELECT . Once the number on the scale is steady, press SELECT again. | 15 is displayed. |
| 15b. Press SELECT . | bUSy is displayed briefly and then ACQUIRE is redisplayed. |
| 16a. Place 30% to 50% of new capacity on the scale. Press SELECT . Once the number on the scale is steady, press SELECT again. | 16 is displayed. |
| 16b. Scroll in the amount of weight used. Press SELECT . | bUSy is displayed briefly and then ACQUIRE is redisplayed. |
| 17. Press MENU . | Fit is displayed. |
| 18. Press SELECT . | Fit dAtA is displayed. |
| 19. Press SELECT . | bUSy is displayed briefly and then a number will be displayed. Keep pressing SELECT until you get the same number (to the 2nd or 3rd decimal) consistently. Ideally this number is less than 3. |
| 20. Press MENU . | Fit dAtA is displayed. |
| 21. Press MENU . | ACCEPT is displayed. |
| 22. Press SELECT . | no is displayed. |
| 23. Press MENU to toggle to yes. | YES is displayed. |
| 24. Press SELECT . | ACCEPT is displayed. |
| 25. Press MENU . | End is displayed. |
| 26. Reset the indicator to read in five pound divisions by following the flow chart in Figure 1. When the number 1 is displayed, repeatedly press the up arrow key until the number 5 is displayed. | |
| 27. Check the unit for accuracy in all positions. | |

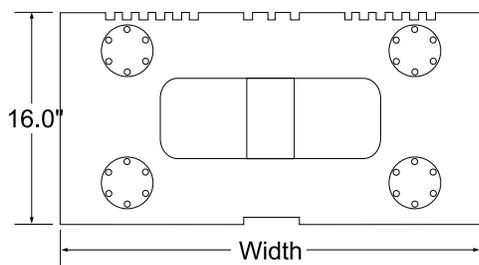
Remember to reconfigure your indicator to display the proper pound increments for your legal-for-trade system.

Calculating New Lifting Capacity

The QTLTSC lift truck scale comes in ITA Class II (16" high, 5,000 lb) and ITA Class III (20" high, 5,000 and 10,000 lb) models. Each class comes in several widths for cleat type carriages. Measure the height and width of the lift truck carriage. Select from the table below the appropriate width that best meets the dimensions of the lift truck carriage. Use the weights, dimensions and the following formula to calculate the net lifting capacity of your lift truck with a scale attached. Refer to Figure 3 on the next page.

$$\text{Net Capacity} = \frac{A(B + C) - D(E + F)}{E + G + H}$$

Class II

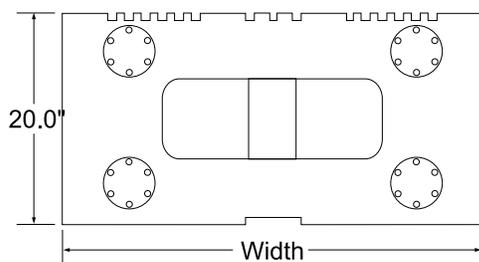


Class II 5,000 lb Models

Scale P/N	Width	Weight "D"	DIM "F"	DIM "K"
48196-0094	30.0"	373 lb	2.0"	4.0
48196-0011	32.0"	381 lb	2.0"	4.0
48196-0029	34.0"	389 lb	2.0"	4.0
48196-0102	36.0"	410 lb	2.0"	4.0
48196-0037	37.0"	413 lb	2.0"	4.0
48196-0110	38.0"	418 lb	2.0"	4.0
48196-0128	40.0"	438 lb	2.0"	4.0
48196-0045	42.0"	446 lb	2.0"	4.0

- A = Truck basic capacity, pounds
- B = Inches from front wheel center line to fork face
- C = Inches from fork face to truck rating point (usually 24")
- D = Weight of the scale in pounds
- E = Inches from front wheel center line to carriage face
- F = Inches from carriage face to scale center of gravity (CG)
- G = J + K
- G = Inches from carriage face to rear face of load
- H = Inches from rear face of load to load center
- J = Thickness of fork
- K = Thickness of scale

Class III



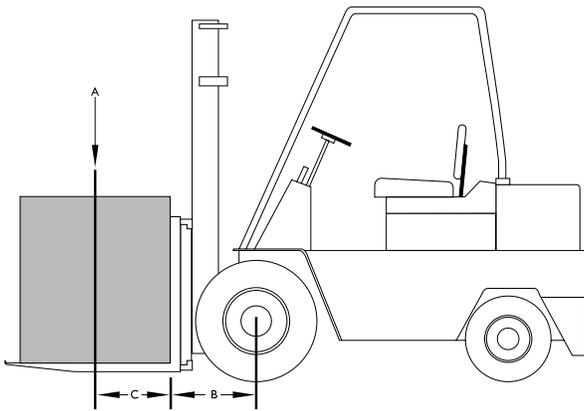
Class III 5,000 lb Models

Scale P/N	Width	Weight "D"	DIM "F"	DIM "K"
51856-0016	36.0"	520	2.00"	4.00"
51856-0024	37.0"	530	2.00"	4.00"
51856-0032	38.0"	540	2.00"	4.00"
51856-0057	40.0"	580	2.00"	4.00"
51856-0073	42.0"	635	2.00"	4.00"
51856-0099	44.0"	685	2.00"	4.00"
51856-0115	46.0"	700	2.00"	4.00"
51856-0131	48.0"	720	2.00"	4.00"

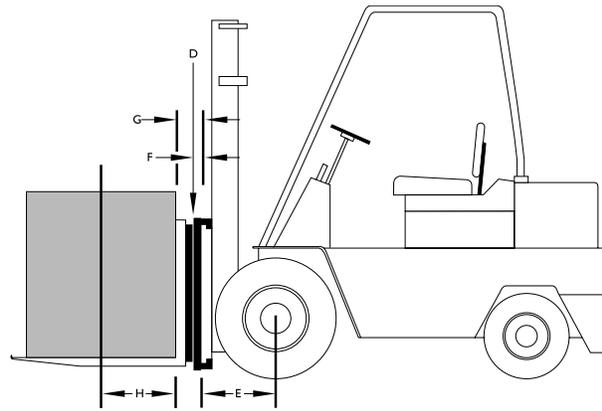
Class III 10,000 lb Models

Scale P/N	Width	Weight "D"	DIM "F"	DIM "K"
51857-0031	40.0"	725	2.75"	5.50"
51857-0056	42.0"	780	2.75"	5.50"
51857-0072	44.0"	795	2.75"	5.50"
51857-0106	47.0"	855	2.75"	5.50"
51857-0114	48.0"	865	2.75"	5.50"
51857-0155	52.0"	935	2.75"	5.50"
51857-0197	56.0"	1005	2.75"	5.50"
51857-0239	60.0"	1030	2.75"	5.50"

Average loss in lifting capacity for a QuickTach lift truck scale is 12 to 14%.



Lift truck with no scale



Lift truck with scale

Figure 3
Drawings for calculating new capacity

Weigh-Tronix

1000 Armstrong Dr.
Fairmont, MN 56031 USA
Telephone: 507-238-4461
Facsimile: 507-238-4195
e-mail: industrial@weigh-tronix.com
www.weigh-tronix.com

Weigh-Tronix Canada, ULC

217 Brunswick Blvd.
Pointe Claire, QC H9R 4R7 Canada
Telephone: 514-695-0380
Facsimile: 514-695-6820

WEIGH-TRONIX

Weighing Products & Systems