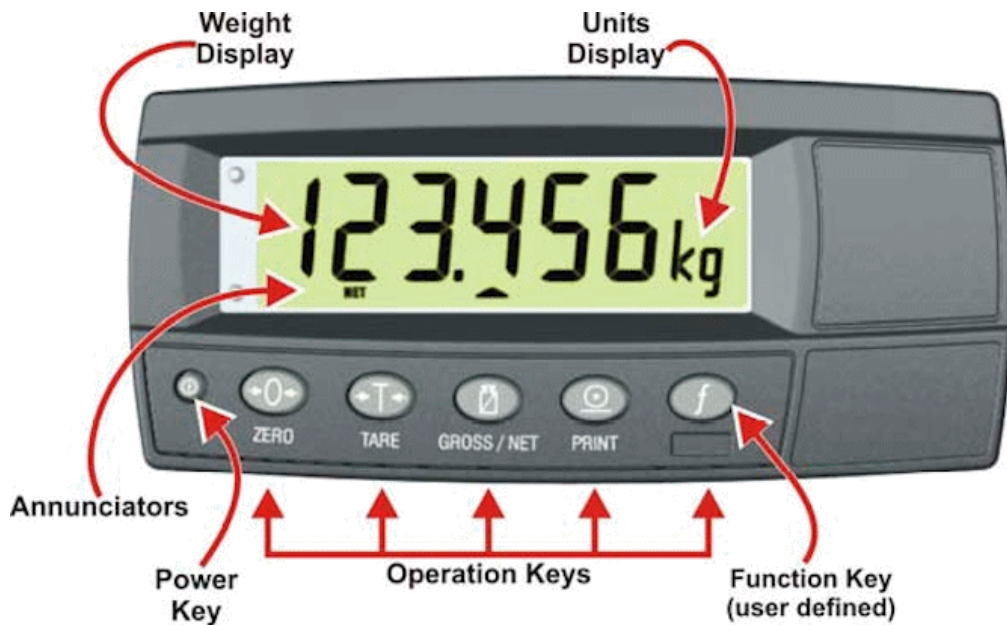


Short Calibration Procedure

LTWS-1 Hydraulic Weighting System Rinstum-R320 and GSE-250 Indicators.

Firmware A301 v1.00 to v1.53

(Last revision 28 September, 2010)



General comment:

Your **LTWS-1 Hydraulic Weighing System** can This short calibration procedure is useful where you have already set up and calibrated the scale and now only intend to "Fine tune" the system.

CALIBRATION:

Apply Power:




Activate Calibration Mode:

Simultaneously hold down the small Power Key  and the "F" Key  for about two (2) Seconds to enter **SetUp/Calibrate Mode**.

The indicator will display in automatic sequential order: FULL, SETUP, **the firmware I.D.** , and bUILD (BUILD)



Press "0" (ZERO)  until "OPT iON" (OPTION) is displayed



Press "T" (TARE) (8 TIMES) until "StArt" (START) is displayed.




Press GROSS/NET key and either "kEy" (KEY) or "AUtO" (AUTO) will be displayed



Press "PRINT" key until "kEy" (KEY) appears on the display



Press  to store the "kEy" (kEy) setting. The Display will revert to "StArt" ("START")




Press "0" (ZERO)  until "CAL" (CAL) is displayed



Press "T" (Tare)  to select "ZEro" (ZERO)




Press GROSS/NET key  and the display will show **"(some number)"**.

This number is "live" and related to the hydraulic pressure of the instant. (See tech notes for usefulness of this number in calibrating and trouble-shooting.)




Lift empty forks and stop at the height where you will normally weigh your loads.


Press  to store the "ZErO" (ZERO) setting. The Display will show "Z.in.P" momentarily, then Display "0 lb" or a weight close to zero pounds.



Please remember that this number is "live" and related to the hydraulic pressure of the instant. After the initial "0" is set, the number will change with bleed-off of hydraulic pressure. This is normal in a "live" measurement environment. The Indicator Firmware deals appropriately with bleed-off when the system is in "AUTO" mode instead of manual (KEY) mode.


Press "T" (Tare)  (two times) to select "SPAN" (SPAN)



Press GROSS/NET key  and the display will show "(some number)".

This number is "live" and related to the hydraulic pressure of the instant. (See tech notes for usefulness of this number in calibrating and trouble-shooting.)



Press GROSS/NET key  again to enter your Known Weight. The display will show the last calibration weight with a flashing digit.

Enter your test weight value using the GROSS/NET key to select the flashing "0" and change the value of that flashing number with the PRINT key.




Lift the test weight and stop at the height where you will normally weigh your loads.


Press **f** to store the "SPAN" (SPAN) setting. The Display will show "S.in.P" momentarily, then display the weight of your test load. This is a "live" weight and will change with bleed-off.




Please remember that these numbers are "live" and related to the hydraulic pressure of the instant. After the lift is stopped, the number will change with bleed-off of hydraulic pressure. This is normal in a "live" measurement environment. The Indicator Firmware deals appropriately with bleed-off when the system is in "AUTO" mode instead of manual (KEY) mode.

Press "0" (ZERO)  until "OPT iON" (OPTION) is displayed




Press "T" (Tare)  (eight times) to select "START"



Press GROSS/NET key  and "kEy" (KEY) will be displayed

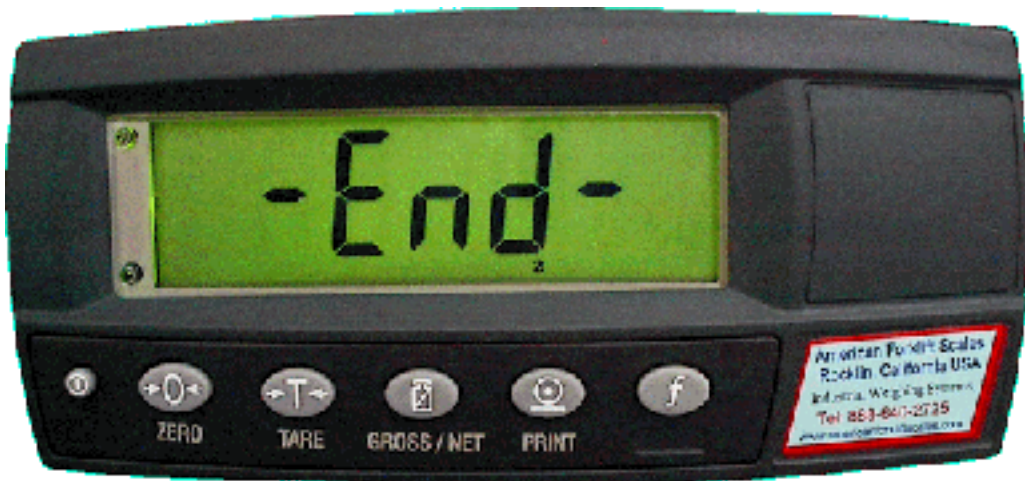
Press "PRINT" key  until "AUtO" (AUTO) appears on the display



Press  to store the "AUtO" setting. The Display will revert to "StArt"



Press "0" (ZERO) several times  until "End" (END) is displayed



Press "T" (Tare)



to Save and Exit. The display will show "SAVINg" and enter normal

Weighing Mode.



Detailed Instructions:

First, Determine Repeatability and Error

Determine the repeatability of the weighing process. In this part of the calibration process, we are determining if our driver's weighing technique will yield REPEATED and close weight readings. At this step, we are not concerned about accuracy, only about repeatability and consistency.

- Lower the test load to the ground.
- Back away from the test load.
- Return to the test load.
- Position your truck to be ready to lift.
- Before you lift, press the forks to the ground and note the (-) number indicated.

- Lift and note the weight when the small “H” appears and the weight is frozen.
- Lower the test weight and back off.

Repeat this process at least four or five times, each time noting the (-) reading and the weight reading.

The list of weights should be close.

For example, if the (-) number is -640, you should expect all (-) numbers, when you press the forks to the ground to vary not much more than +/- 10 pounds or so. (-630 to -650 etc.)

This estimate and consistent repeatability should also apply to your weight reading.

For example, if your test weight is 1600 pounds, the indicated weight at this step may be off by a large amount, but the displayed weight should always be within +/- 20 pounds or so. (1610, 1590, 1600, etc). If the weight reading is off by 50 or 100 pounds, you are still looking for repeatable readings and consistency, not accurate weight. (1690, 1720, 1700, 1710, etc. In this example, there is about 1% variation between the high and low. All are well within the expected accuracy for repeatability.)

If you have consistent readings, you may proceed to correcting any weight error. However, if your readings are separated by more than about a 2 or 3% spread, or if the weights are “all over the place”, you need to investigate alternate methods of machine operation which will isolate the error source and provide a remedy to promote consistent readings. (See List of Machine Operation Hints)

Correcting Displayed Weight Error

In the precious step you will have established that the Operation of the machine and scale are providing reliable readings, and now it is necessary to remove any weight error.

Determine the difference between the calibration SPAN "WEIGHT" and the operating actual weight displayed. We will enter the calibration mode and adjust the SPAN entry to remove the displayed weight error.

For example, if the calibration Weight entered was 1600 pounds and the displayed weight is always 1690 to 1720, then you need to reduce the calibration weight entry by the amount of the error, or 1600 (actual calibration weight) - 100 (average error) = 1500 will be your new calibration weight entry.

Re-enter FullSetup.

- Set START to Key and go directly to CAL/SPAN.
- Press Gross/Net twice to put the SPAN in the setting mode. Enter the adjusted SPAN calibration weight (test weight)

- Lift the test load and immediately press "F" or Tare to establish calibration.
- The display should show SinP, then show a number.
- Reset START to AUTO, go to END and press TARE to Save.

Return to Determine Repeatability and Error and repeat the entire process until you have repeatable, accurate weights.

Calibration and Accurate Weight Display Adjustment is now complete.

Call Tech Support if you need assistance. **(805-236-7406)**. Tech Support at this number is available 7 days per week, including holidays.