

Warning:

If your vehicle has an engine that has spark plugs, be sure they are resistor type spark plugs or you may damage the memory chip of this unit. If the scale unit fails when the engine is running, but will operate if the engine is off, this is a symptom of spark plug interference from non-resistor plugs

Principal of operation:

The weighing system is designed to read the pressure in the first stage of the fork lifts main lifting cylinder(s). The digital indicator converts this signal to a display that can be calibrated to read the weight that is being lifted.

Accuracy errors of this method can be as much as 2% of the lift truck capacity. That is, on a 5000 lb. capacity lift truck, the reading can be within 100 lbs. plus or minus at any weight from 0 to 5000 lbs and be within tolerance.

There are a number of things that have an effect on the systems accuracy, such as hydraulic system pressure, fluid viscosity and temperature, mechanical friction, and leaking seals and valves. Lifting and weighing in the same manner (speed and height) each time is mandatory for the most accurate readings.

Installation:

Lift trucks vary in their configuration from model to model and manufacturer. The installation of the indicator and sensor is general and a qualified technician may find another means to install the scale. In any installation, the safety of personnel & equipment must be of primary importance.

To achieve the best accuracy possible (+ or - 2% of the lift capacity), the unit should be in good mechanical and hydraulic condition. The lifting system must be checked for leaks, fluid levels, any worn or bent mast slides, worn rollers and bearings, leaky or worn hoist piston and ram seals. Insure that mast slides are clean and lubricated.

The pressure sensor can sense pressures from 0 to 5000 PSI. The sensor must be connected somewhere between the lift valve and the lift cylinder(s). The sensor must sense the pressure that is in the lift cylinder, so watch out for any pressure bypass valves. The sensor has a ¼ inch NPT male thread. It needs to be mounted on at least a 2 foot hose that is Teed off the main line. This will keep high temperature fluid away from the sensor. The hose can be as long as needed and for outdoor installations, locate the sensor in a place that allows the sensor to warm in freezing weather. Bleed any air in the attached line.

Mount the digital indicator in a location that does not interfere with fork lift operation, but allows the operator to see and use the unit. The power line can be attached to 12 or 24 volts. **Assure the resistor is in line with the red power line if using a 24 volt OR higher power source** Attach the black line to battery negative and the red wire to battery positive. A connection directly to the battery is best to avoid electrical noise interference.

Preliminary Testing and Calibration:

The system will weigh accurately only in the first stage on a truck that has multiple telescoping lift cylinders.

A weighing height must be established and the best method to reach the weighing height must be determined. Setting zero, as well as weighing a load, must all be done in the same manner. Repeatability is the key to accurate weighments. We will use a method of lifting then lowering a few inches to the set height, but if lifting to the height without lowering gives better results, then do it that way.

You will need to have a known weight available that is evenly distributed on the pallet. The weight should be at least 40% of the lift's capacity.

1. Assure that the mast is not tilted, then raise the forks to approx. 16 inches above ground level
NOTE: On front end loaders, the height should be around eye level.
2. Use a piece of tape to make a mark on the mast and the carriage so the lift height can be seen and repeated easily by the lift operator.
3. Lower the lift back to the ground, then lift to approx. 2 inches over the tape marks, then jog the lift down to the marks.
4. Press and hold the PRINT button in while turning the power on.
5. When the display shows ----- release the PRINT button.
6. Press and release the TOTAL button.
7. Press the ZERO button until the display shows zero.
8. Lower the lift and get the test load on the forks.
9. Lift the load to approx. 2 inches over the tape marks, then jog the lift down to the marks.
10. Allow the pressure to settle for approx. 5 seconds.
11. The weight display can be altered up or down by pressing and holding the TOTAL button to make the display go down, and holding the PRINT/+ button to make the display go up.
12. Use the PRINT and TOTAL buttons to make the display come as close to the test weight as possible without spending a lot of time. The weight display may be changing by itself due to hydraulic bleeding.
13. Turn the power OFF and then turn it back on.
14. The system is ready for repeatability testing.

Repeatability test:

1. Lower the forks, then bring them to the weighing marks using the method of raising a few inches over then jogging down to the mark.
2. Allow the weight to settle then press the ZERO button until the display shows zero.
3. Now, lower the load and lift as in step #1 and see if the reading is within the 2% of capacity of lift. That is, on a 5000 capacity lifttruck, if the number is within 100 plus or minus of the weight being lifted, then it is repeating within the limits of this type of weighing system.
IF THE WEIGHT READINGS DO NOT REPEAT WITHIN THE 2% RANGE, TRY A DIFFERENT METHOD OF LIFTING TO THE WEIGH MARKS. IF A DIFFERENT METHOD WORKS BETTER, THEN USE THAT METHOD WHEN CHECKING OR SETTING ZERO AND WHEN WEIGHING LOADS. IT DOES NOT MATTER HOW THE LIFTING IS DONE, AS LONG AS IT IS DONE THE SAME EACH TIME.
4. Lift the known weight load in the same manner and allow the weight to settle. This takes 3 to 7 seconds for the numbers to pause. Read the weight during this pause.
5. Lower the load and repeat step 4 a few times to determine repeatability within the 2% range.
6. If the numbers repeat but the weight is not correct, then do the **Final Calibration**. If the weight is correct, then go to the **Operation** instructions.

Final Calibration:

Do this procedure to alter the weight reading to better match the test weight load. This can be done whenever hydraulic or mechanical changes or repairs are done to the lift system.

1. Turn power off.
2. Press and hold the PRINT button in while turning the power on.
3. When the display shows ----- release the PRINT button.
4. Press and release the TOTAL button.
5. Lift the empty forks to the weigh position.
6. Press the ZERO button until the display shows zero.
7. Lower the lift and get the test load on the forks.
8. Lift the load to tape marks, using the procedure that works for best repeatability.
9. Allow the pressure to settle and wait for the pause.
10. The weight display can be altered up or down by pressing and holding the TOTAL button to make the display go down, and holding the PRINT/+ button to make the display go up.
Use the PRINT and TOTAL buttons to make the display come as close to the test weight as possible without spending a lot of time. Again, if the weight reading is within the 2% range, it should be time to move on.
The weight display may be changing by itself due to hydraulic bleeding.
11. Turn the power OFF and then turn it back on.
12. The system is ready for use.

Operation:

IMPORTANT: When first turning on the unit, with the lift empty, raise to the weigh point and press the ZERO button. Do this occasionally to check for a good zero reading.

Use the scale system in the same manner that was used during the calibration and repeatability testing.
REMEMBER CONSISTANCY IS THE KEY TO GOOD WEIGHT READINGS

There is a LOCK mode available for use that can lock the display on the weight when it becomes stable. This feature can be turned on and tested by lifting a test load to see if it gives good results. It works on weights that are over the trip-point and resets when the weight goes below the trip-point. Pressing the RE WEIGH button will cause the LOCK mode to reset and lock on the next stable weight without going below the trip-point.

NOTE: Parameters 4, 7 and 8 are used to alter the LOCK-ON mode.

There is a total weight accumulation feature that allows for totaling multiple weighments.

1. Press the PRINT button to add the weighment to the total.
2. The display will show ----- until the PRINT button is released, then it will show the TOTAL weight for about 3 seconds.
3. Press the TOTAL button to view the total.
4. To PRINT and CLEAR the total, press and hold the TOTAL button while momentarily pressing the ZERO button.

SUBTRACT from the TOTAL:
NOT AVAILABLE

Factory calibration procedure

(Perform this calibration if large changes need to be made or if the graduation size was changed in the parameter settings)

1. Turn power off.
2. Press and hold the PRINT button in while turning the power on.
3. When the display shows ----- release the PRINT button.
4. Press and release the TOTAL button.
5. Lift the empty forks to the weigh position.
6. Press the ZERO button until the display shows zero.
7. Lower the lift and get the test load on the forks.
8. Lift the load to the tape marks.
9. Allow the pressure to settle and wait for the pause.
10. Press the RE-WEIGH button to set the unit for coarse adjust mode. This will cause the weight to change in large steps when adjusted in the following step.
11. The weight display can be altered up or down by pressing and holding the TOTAL button to make the display go down, and holding the PRINT/+ button to make the display go up.
Use the PRINT and TOTAL buttons to make the display come as close to the test weight as possible.
NOTE: This number will not be very close during the first adjustment cycle.
12. Press the LOCK/NORMAL button and note the display flashes all ----- dashes. This steps the sensitivity of the adjustment down. Now go back to step 11 and adjust for a closer reading. Repeat steps 11 and 12 until the correct weight reading is obtained.
13. Continue to press the LOCK/NORMAL until the dashes stay on the display for a longer period of time, the display will come back to showing the weight and the unit is now ready to use.

MODEL TR-1-NK PARAMETER SETTING INSTRUCTIONS

NOTE: THESE ARE FOR REFERENCE IF CHANGES NEED TO BE MADE - IT SHOULD NOT BE NECESSARY UNDER NORMAL INSTALLATION

The internal parameters have been set for your scale system. Alteration of these parameters require and understanding of digital Scale systems and how altering these parameters will effect operation.

Parameter Entry:

1. Turn power off and hold the PRINT button while turning the Power on.
2. Note the display shows all dashes.
3. Press and release the LOCK/NORMAL button.
4. The display will show 00--nn (The 00 denotes parameter number 0 and the nn may be any 2 digit number representing the current value set for parameter number 0.
5. To change the value of this parameter, use the PRINT button to go up or use the TOTAL button to go down.
6. To cycle to the next parameter, press the LOCK/NORMAL button
8. Continue steps 5 and 6 for all parameters desired.
9. When finished, press the ZERO button to return to the weight display mode.

FACTORY SETTING OF PARAMETERS as of 5/02/2006
(parameter number is the single digit and factory setting is the 2
digit number)

0=00 = LB or KG / 00 = LB light is on / 01 = KG light is on

1=02 = Sample rate / Update rate.
The sample rate can be set for the desired operation.
Note that having the continuous data output turned on by
parameter 9, will slow down the displayed update rate.
Set this to a value between 1 and 7.
1 is the slowest and most stable update rate
7 is the fastest update

2=10 = The displayed graduation size. Set at 05 if a
graduation size of 5 is required.
Valid settings are from 01 to 50
NOTE: Scale capacity of 60,000 lbs or more, must have
a graduation of 10 or higher
Forklift setting is normally 10 and loaders 50

3=99 = The overload trip-point in hundreds of graduations.
If the scale is to be 5,000 by a graduation of 10, then
a setting of 05 would cause the overload to activate at
5,000.
Set to 99 if no overload point is desired.
Set to 00 for a 10,000 graduation overload.

4=01 = The motion detection window setting. Set this to the
number of graduations that will be allowed as a no-
motion condition.
This will effect the lock-on-weight feature.

5=00 = Mode of operation:
00 = Normal mode all buttons active
01 = Normal mode and Zero & Reweigh button only active
02 = Power up in Lock-On-Weight mode all buttons active
03 = Power up in Lock-On-Weight mode and Zero & Reweigh button

6=00 The decimal point position. ie, 02 will cause 0.00

7=50 = Automatic Lock-On-Weight trip point to activate
Set for the weight reading that will re-trigger an automatic
Activation of the Lock-on feature. For example: To trigger
the Lock-On feature when the weight goes above 50, set this
value to 50. NOTE: If the graduation size is 10 or higher,
then this setting is multiplied by 10. (example: for a trip
point of 200, set to 20 or a trip point of 50, set to 05)

8=04 = Automatic Lock-On-Weight delay.
Set to the number of samples to delay before locking on
weight. This delay starts after the trip point (parameter #7)
has been met. This allows the carriage to reach the weigh
point before starting a test for a stable weight reading.
For example: To delay 4 updates of the weight reading after
it crosses the trip-point, set this parameter to 04.

9=00 = Printer OR Continuous data output
wire cable direct to main board or ask for data
output kit. (contains terminal block and strain
relief for enclosure.

NOTE: Set to 10 or 11 to disable the print button

00= Printer output of displayed weight only to
EPSON TM295 or other Epson printer.
01= Same as 00 without the EPSON format codes
02= Printer output of gross tare and net with EPSON
printer codes.
03= Printer output of gross tare and net without
EPSON format codes.
04= ELTRON form recall TARA for displayed weight print
05= ELTRON form recall TARAGTN for gr/tr/nt print
10= Continuous output of displayed weight PRINT/TOTAL DISABLED
11= Continuous output of gross tare net PRINT/TOTAL DISABLE

Printer connector pins
Pin 3 is data to the printer
Pin 5 is ground