SP-1000-Series SkidWeigh Plus
Check Weighing for Material Handling Vehicles & Freight Weight Verification

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Ver.120706-19

# Material Handling Vehicle On-board Weight Verification

The **SP-1000 Series SkidWeigh Plus** is forklift check weighing/overload warning system used to verify load weights on the move. **This is not a "*Legal for Trade*" scales, but an economical on-board check weighing systems.** The installed system will allow your lift truck operator to increase vehicle utilization, increase productivity, provide operator safety and display and verify the freight load weights. The load weight readout accuracy is within +/-0.5% to +/-1% of the vehicle's lifting capacity.
Example: Toyota forklift, lifting capacity 3000 pounds, the freight load readout accuracy will be within +/- 15 to 30 pounds.

To obtain a load weight readout the lift truck operator is to lower the loaded forks to the ground, press **"W"** key and then **just lift the load above the ground**. Within 3-5 seconds the load weight will be displayed. This load weight will be shown on the LCD display for few seconds and than the system will go into monitor mode.

Proper Operator Procedure for Weighing Loads

1. Insert the forks into the pallet or under the product to be weighed and lower the forks to the ground. Make sure that the pallet is positioned all the way on the fork's carriage.

2. Press **W** (Weigh) key. Display will show **Raise forks…**

3. Lift the loaded forks 2-3 inches (Up to 10 cm) above the ground. You must activate the lift control valve the same way that you normally do when picking up the loads. ***Do not attempt to slow down this operation. Do not start to tilt the load in any other direction and do not lift the load to different heights.***

4. As soon as the load has been lifted, the LCD digital display will show "**Weighing…**", and after few seconds the weight value of the lifted load will be displayed. This load weight will be displayed on the indicator for few seconds and the system will go back to show date and time.
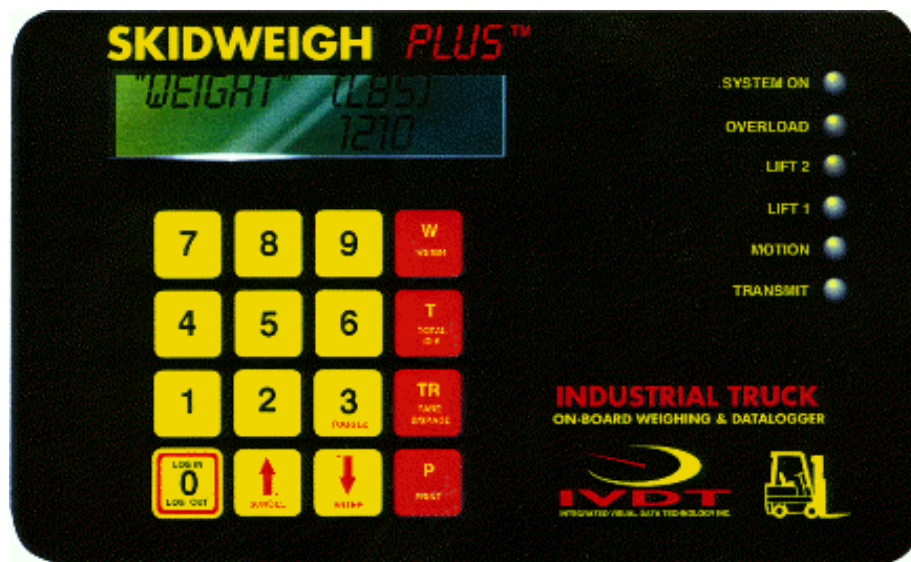
Mounting Location for Digital Indicator

Install the mounting bracket with the anti-vibration mount and fasten the digital indicator on the vehicle's dashboard or side railing, preferably on the right hand side.

Anti-vibration mount, ¼"-20 UNC (25 x 20 mm, vulcanized rubber, Duro5) supplied with every kit

Pressure Transducer Installation

1. The pressure transducer body has a male port ¼"-18 NPT. Standard cable length is 6' (1.5 meters).
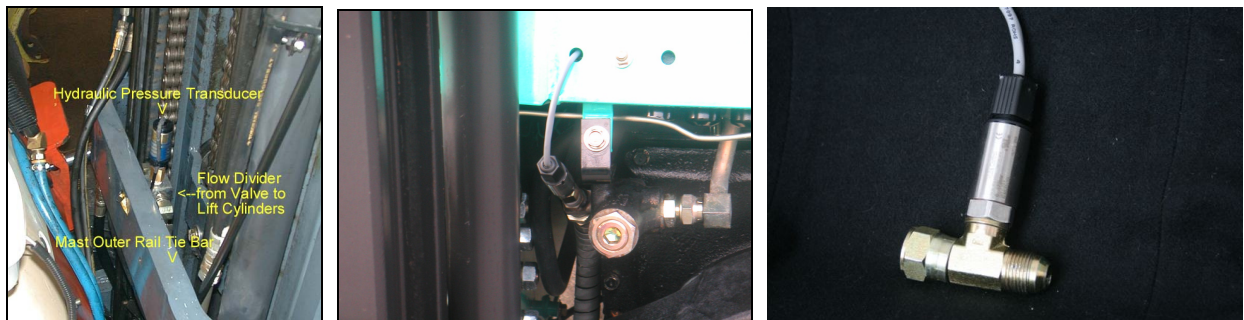
2. The pressure transducer must be installed in the **hydraulic line between the lift control valve and the lift cylinder(s).**

3. The majority of pressure transducer installations into the vehicle hydraulic system will require some kind of T- piece to be connected in the lifting hydraulic line. (See picture bellow) In addition to the T- piece installation method, the pressure transducer can be installed in the flow divider - either in the spare plug or by drilling and tapping for 1/4"-18 NPT in the flow divider body or at any "larger elbow", as long as it is in the vehicle lifting hydraulic line.

4. Make sure that the installed pressure transducer will not touch any moving parts or the assembly of the forklift or any other material handling vehicle when the vehicle is in normal operation.

5. Use thread seal on the pressure transducer to ensure tight fit.
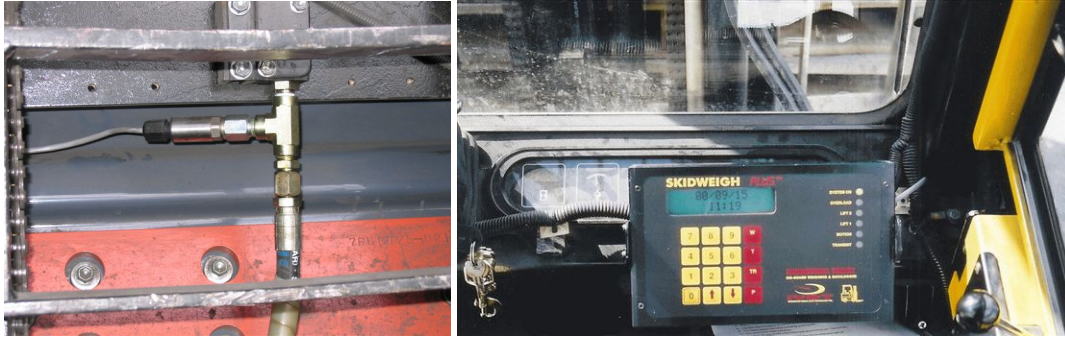
Example of the pressure transducer installation / digital indicator on Toyota forklifts with short mast

Single cable with seven wires

Electrical connections

Pressure transducer:

RED Wire of the pressure transducer cable to **RED WIRE** of the 7 wires cable from the indicator
BLACK Wire of the pressure transducer cable to **BLACK WIRE** and **GREEN WIRE** of the 7 seven wires cable from the indicator
WHITE Wire of the pressure transducer cable to **WHITE WIRE** of the 7 wires cable from the indicator

Power:

 ORANGE Wire (+) Connect to the ignition switch "ON" contact.
 BROWN Wire (-) Connect to battery negative (Electric motor powered vehicles) or to the vehicle chassis on combustion engine powered vehicles.

1.0 User Mode

This is the normal operation mode.

Seven distinct classes of operations can take place, startup, monitor, statistical, weighing, printing, query and termination.

1.1 Start up Operation

If the System ON light is activated, there is no need to log in. All operational function will be enabled.

If the System ON light is NOT activated the operator must log in. Press the **"0"** log in key and enter the operator ID number as requested on the LCD display.

This operator ID number can be any number, minimum 2 digits and maximum 4 digits.

After you enter a valid ID operator number, press arrow down (↓) key or Enter key. The System ON light will be activated and display will go back to the default date and time.

System is ready to be used.

1.2 Monitor Mode

In this mode the software is constantly scanning all the inputs for status and changes. As the pressure output changes the LIFT 1, LIFT2 and LIFT3 LED's will be activated. When the motion input is activated the motion LED will be activated.

1.3 Statistical

Once a valid operator ID has been entered all previous session statistics are initialized to zero. This includes Waybill ID's. Since only one session will be stored there is no minimum time for which the operator ID must be inserted. As long as the valid ID number is in the system the following statistics will be monitored. Keep pressing arrow down (↓) key.

(Only is **Stats Visible?** are set to **YES** in the calibration mode)

1.4 Weighing Operation

The weighing capabilities are activated by **"W"** (Weigh), **"T"** (Total / ID#), and **"TR"** (TARE B/Space) keys.

Since there are only three keys and many possible operations, the keys have multiple functions. The function of the key is defined by the message that appears in the LCD display.

"**W**" – The **WEIGH** Key

If the LCD display is showing the date and time, than pressing WEIGH will instruct the operator to "Raise forks…", "Raise Bucket", etc.

If the vehicle is stationary and the pressure signal is present; weight readout will be shown. This weight readout will remain for few seconds after which the display will revert to the date and time display.

"**T**" – The **TOTAL** Key

The TOTAL key allows one to recall Waybill ID# or to add a weight reading to a Waybill ID# total. The TOTAL key operates on what the LCD is displaying.

If only the date / time are shown, than pressing the TOTAL key initiates only a display function.

If a weight is shown on the LCD display than pressing the TOTAL key is the first step in storing the displayed weight to a Waybill ID#.

In either case, after the TOTAL key has been pressed, the system will display the current last used Waybill ID#.

If the weight reading just taken is to be added to this Waybill ID#, than pressing TOTAL key once more will complete the operation.

If a new Waybill ID# is desired than it can be keyed in at this time. Once a correct Waybill ID# has been entered the system will wait for the TOTAL key to be pressed to indicate that the total is to be updated.

If the keyed in Waybill ID# does not exist then a new Waybill ID# record will be created.

If 50 Waybill ID# records already exist then a message indicating this will be displayed. The user will then have to either continue using only existing Waybill ID# records or will have to download the session to clear memory.

Exactly the same steps are used to display the current total for a given Waybill ID#, the only difference is that when TOTAL key is pressed for the first time, it should be done while a date / time display is active.
In brief, to store a displayed weight one presses TOTAL key, modifies or leaves the displayed Waybill ID# and then presses TOTAL key once more.

To display a Waybill ID# total, one starts from a date / time display and presses TOTAL key, modifies or leaves the displayed Waybill ID# and then presses TOTAL key to produce the desired display.
The timeout of approx 5 seconds will be in effect after TOTAL key has been presses the first time. This means that the operator has approx. 5 seconds per keystroke to enter a Waybill ID# and then approx. 5 seconds to press TOTAL key the second time. This is to ensure that if the operator for some reason does not go through the complete total sequence, the system will return to monitor mode automatically.

"TR"- TARE and B/Space key
The TARE key also has multiple functions.
If the LCD is displaying the date / time then pressing the TARE key will display the current tare weight for approx. 5 seconds.

Pressing the TARE key again while the tare display is active will prompt the operator to enter a new tare value or press 0 to reset the current tare value to zero. In either case you **must press arrow down (↓) key** (Enter key) immediately <u>for changes to take effect</u>.

The last function of the TARE key is to correct keyboard entry errors when entering Waybill ID# or any numeric input. If a mistake is made, then the TARE key will act as a backspace.

Although the TARE key has many functions, no memorization is required. One need only to be aware of the current environment or state of the system.

1.5 Printing
Printing operations are handled exclusively by the **"P"** print key

"P" The PRINT key
The PRINT key will only be functional if a local printer is connected to the data logger. If the printer is connected then pressing PRINT key will cause whatever is displayed on the LCD to be printed. The data sent to the printer will be enhanced with:
- Operator ID#
- Vehicle Number
- Department Number
- Time
- Date

In addition to the above will be whatever is on the LCD display.
In the case of a Waybill ID# total, the number of weight readings taken and total weight will also be printed.
In the case where the LCD is displaying only date / time pressing PRINT key will cause all of the statistics to be printed.

1.6 Query
While the date / time display is showing on the LCD, pressing the down arrow (↓) key will allow one to scroll through the accumulated session statistics. A 5 seconds time-out will be active during this function. If no key is pressed for approx.5 seconds, the unit will return to normal monitoring mode.

1.7 Termination of Session
By pressing the "0" log out key twice the session will be terminated. Upon termination a number of events will occur:
- The system on LED will be turned off
- The current session statistics will be closed
- The session information will be sent to printer if PRINT key pressed

General Notes:
1.7.1   Keyboard entries will be acknowledged with a beep
1.7.2   Date / Time will be maintained with a Real-Time-Clock which is battery backed-up
1.7.3   Only mini dot matrix printer from NCI will be supported
1.7.4   The system is configured for 50 Waybill ID#
1.7.5   Each Waybill ID# can have multiple weight entries
1.7.6   Each Waybill ID# can have maximum up to 16 digits number
1.7.7   Time-out between keyboard is within 5 seconds
1.7.8   Calibration password: 7134692
1.7.9   System application: **Forklift, Loader, Truck, Lift Table, Waste Vehicle, Dump Truck, Side Loader, Pallet Truck, Scale (Custom)**
1.7.10   Weight shown in pounds or kilograms
1.7.11   Automatic pressure transducer checking function
1.7.12   Weighing readout resolution, any value entered by the user
1.7.13   Overload warning setup with 3 independent weight values
1.7.14   Automatic calibration procedure

SP-1000 Digital Indicator Calibration Procedure
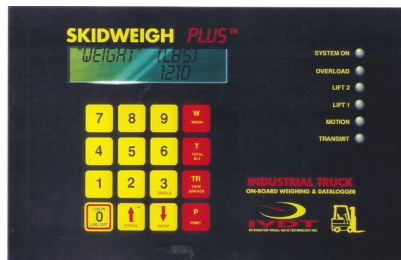
Calibration / Setup Procedures Concept

The **SP-1000 Series** SkidWeigh Plus systems calibration/setup procedures are simple. There is no input of the complicated codes found on majority of other systems on the market, but the simple steps to complete the automatic calibration of the **empty forks being lifted just above the ground and automatic calibration of the known load weight being lifted just above the ground.** *This calibration procedure applies for all forklifts, loaders, telehandlers, skid-steers, high lift electric pallet trucks, hydraulic lift tables, etc.*

Note: *At any point during the calibration if you make a mistake, for whatever reason, turn the power to the system OFF / ON and start all over. All final calibration and set-up values will be automatically stored after the calibration/setup procedures are finished.*

- The **SP-1000 Series** system has to be calibrated with a known load weight
- Use the customer's floor scale or find a known load weight within the operating facility
- Keep that known load weight nearby to complete the calibration
- For best results, use at least 30% to 50 % known load weights of the particular lift truck's lifting capacity**.**
- **Example:** *For 3000 pounds lifting capacity of the vehicle, use at least 1500 pounds or close to that load weight to be used to calibrate the system.*
- **Note:** If you want the system to show load weight in pounds; use the known load weight in pounds and enter that value accordingly. The same would apply if you want the weight display to show in kilograms. Use a known load weight in kilograms and enter that value into the system accordingly.

Starting Point

When power to the vehicle is turned on the LCD display will show date and time. The system on LED light might be turned off or on and that will depend on the previous setup activities. If the system LED light is activated you must log out in order to get into the calibration mode.
Note: To log out press "0" key twice.

LCD Display	Action Required	Remarks	Option
04/10/15 09:29		LCD display showing date and time. System ON light is turned off	

Activating the System Calibration Mode
- Press **"0"** log in key
- *The LCD display will show "Enter ID number:*
- Press arrow down (↓) key (Enter key)
- *The LCD display will show " Enter Password:"*
- At this point enter following numbers in precise order to get into the calibration mode.

7 1 3 4 6 9 2   and
Press arrow down (↓) key (Enter key)

Note: This is a default master calibration code

LCD Display	Action Required	Remarks	Option
Change Password? **no**	Press (↓) Enter key	Do not change this default password	Special applications. Press 3 key (toggle)
Erase Key codes? **no**	Press (↓) Enter key	Do not change! Only for vehicle access control application.	Special applications. Press 3 key (toggle)
Change Key codes? **no**	Press (↓) Enter key	Do not change! Only for vehicle access control application.	Special applications. Press 3 key (toggle)
Key code enabled? **no**	Press (↓) Enter key	Do not change! Only for vehicle access control application.	Special applications. Press 3 key (toggle)
Application: **Forklift**	Press (↓) Enter key	Default application is for the <u>forklift vehicles</u>	Press 3 key (toggle). Loader, Truck, Lift Table, Dump Truck, Waste Vehicle, Custom Scale, etc.
Time: HR:MIN:SEC **11:52:44**	Press (↓) Enter key if indicated time is right	Key in proper time and press (↓) Enter key to accept	
Date: YR:MN:DAY **04/10/15**	Press (↓) Enter key if indicated date is right	Key in proper date and press (↓) Enter key to accept	
Vehicle ID# **1**	Press (↓) Enter key if indicated ID# is right	Key in proper ID# and press (↓) Enter key to accept	
Department # **1**	Press (↓) Enter key if indicated ID# is right	Key in proper ID# and press (↓) Enter key to accept	
Min. Lift Time **5**	Press (↓) Enter key (Default value is 5 seconds)	Change for special application	
Stats Visible? **yes**	Press (↓) Enter key	All data can be viewed on the LCD display	Press 3 key (toggle) to disable
Printer Type **none**	Press (↓) Enter key if no printer used	Press 3 key (toggle) to find printer type	Default printer type is Weigh-Tronix. Press (↓) Enter key to accept
PC Download? **no**	Press (↓) Enter key	This must be set to NO. Do not toggle!	Special applications. Press 3 key (toggle)
Weight in: **pounds**	Press (↓) Enter key	Default measurement is in pounds. Press 3 key (toggle) to kg.	Press 3 key (toggle) to change to kilograms
Transducer Check **56**	Press (↓) Enter key	This is automatic check that pressure transducer signal is present. If forks lifted, the ADC value will increase.	If the number is not changing with forks lifted then check the electrical connection to the pressure transducer.
Delay Counts **25**	Press (↓) Enter key	Default value is 25	Can be changed as required

Trigger Counts **10**	Press (↓) Enter key	Default value is 10	Can be changed as required
# of ADC samples **50**	Press (↓) Enter key	Default value is 50	Can be changed as required
Scale limit (lb) **0**	Press (↓) Enter key	When showing 0 it means unlimited weight range	Enter any other weight range. It could be vehicle maximum lift capacity.
Scale Resolution **10.0**	Press (↓) Enter key	Default value is 10.0	Enter any other weight readout resolution. As of example, 1, 5, 25, 50, 100, 250, etc.
Do you wish to Calibrate scale?	Press 3 key (toggle) to calibrate the weighing system	**IMPORTANT!**	If you are not calibrating the weighing scale, but only changing other values than press (↓) Enter key to continue.
Lower empty forks…	Lower empty forks to the ground. Press "W" key and lift the empty forks just above the ground.	When lifting empty forks do not slow down the operation and lift it just above the ground.	
Raise unloaded forks…	Lift empty forks	If forks not lifted after the time out the LCD will display "No Lift Registered"	
Weighing…	Do not move vehicle or adjust tilt control		
Weighing… **+**			
This ADC value: **395**	Press (↓) Enter key	This is the ADC value for empty forks lifted.	
Avg ADC value: **395**	Press (↓) Enter key	This is the ADC value for empty forks lifted.	
Average in Another value?	Press (↓) Enter key		Note: You could initiate more readings and get the average. Press 3 key (toggle) to repeat the procedure.
Load and Lower Forks…	Load the forks with a known weight and lower it to the ground. Press "W" key and lift loaded forks just above the ground.	Use at last 25 to 50 % of vehicle lift capacity known load weight.	
Raise loaded Forks…	Lift loaded forks	If loaded forks not lifted after the time out the LCD will display "load and Lower forks…	
Weighing…	Do not move vehicle or adjust tilt control		
Weighing… **+**			
This ADC value: **1879**	Press (↓) Enter key	This is the ADC value for loaded forks lifted.	

Avg ADC value: 395	Press (↓) Enter key	This is the ADC value for loaded forks lifted.	
Average in Another value?	Press (↓) Enter key		Note: You could initiate more readings and get the average. Press 3 key (toggle) to repeat the procedure.
Enter Load (lb) 0	Enter the known load weight	As of example a known load weight is 1550 pounds	
Enter Load (lb) 1550	Enter 1550 and press (↓) Enter key		
Scale Calibrated		The weighing portion of the system is calibrated!	
Lift 1: (lb) 100	Press (↓) Enter key	Default value is 100.	To change enter the new value and press (↓) Enter key
Lift 2: (lb) 1000	Press (↓) Enter key	Default value is 1000.	To change enter the new value and press (↓) Enter key
Overload: (lb) 3000	Press (↓) Enter key	Default overload value is 3000.	To change enter the new value and press (↓) Enter key
Finished?	Press (↓) Enter key to complete system setup and scale calibration	Important! You must press (↓) enter key to complete system setup	
Calibration Complete		LCD will show date and time. System On light will be off.	

On Board Dot Matrix Mini Printer (IPR-Series)

Standard Freight Weight Printout Report

SkidWeigh Plus Report
Date: 98/02/24
Time: 11:34
Oper.ID: 1201
Vehicle ID: 32
Dep#:   12
Way#:   1667
# of WRT   4
Tot. Weight   1250 lb