

MODEL LNW-5
LIFT-N-WEIGH
LIFT TRUCK SCALE



Pacific Scale Co. Clackamas, Oregon

LIFT-N-WEIGH

The Lift-N-Weigh model LNW-5 provides a quick and convenient weight check for shipping and receiving. Weighing while handling eliminates those extra time consuming trips to a stationary scale. Mounted for viewing, while not interfering with visibility, it gives the operator a quick check for unsafe overloads.

The Lift-N-Weigh operates on the principal that there is a direct correlation between the pressure in a lift cylinder and the weight on the forks. A transducer in the instrument changes hydraulic pressure to an electrical signal, which ends up as a weight reading on the display.

Installation consists of mounting the display at a convenient location. "Teeing" into the lift truck hydraulic line and connecting it to the display. The D.C. power line is then connected to the lift truck battery. The unit comes pre-calibrated for a specific lift truck. If the weight reading is incorrect or the scale is installed on a different truck it can be re-calibrated in the field. A 6 foot - high pressure hose and DC wiring harness are included. We do not furnish the "tee" fitting to connect to your hydraulic lines.

SPECIFICATIONS

CAPACITIES - up to 199,000 lbs.

DISPLAY - 6 digit liquid crystal display
height of numbers 0.70"
backlit for high visibility

POWER - 12 volt D.C. to 50 volt D.C.

CONTROLS - External - ZERO knob and ON/OFF switch
Internal - calibration and lb/kg

HOUSING - Cast Aluminum

GRADUATIONS - 10 lb. up to 10,000 lbs.
100 lb. up to 199,000 lbs.

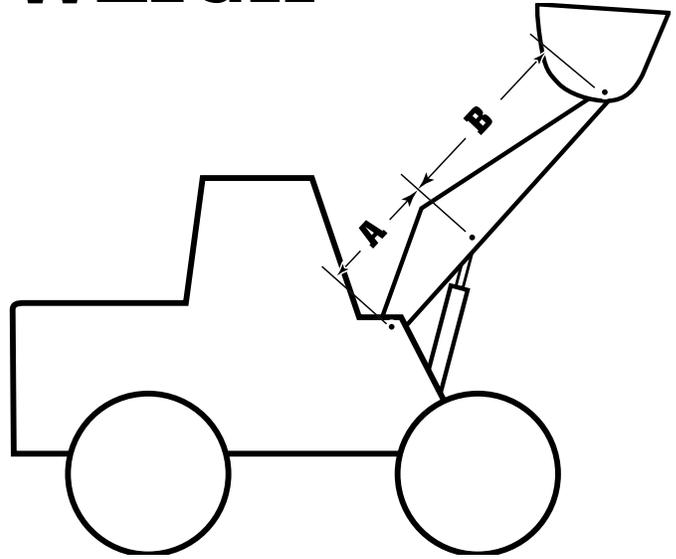
DIMENSIONS - Housing - 5.75" wide x 3.75" high
x 3.5" deep
Overall - 6.65" wide x 6" tall
x 4.74" deep

ACCURACY

The operating accuracy, when installed on the vehicle, is governed by the mechanical conditions of the vehicle. The indicator operates off the pressure developed in the main lifting ram. Because of the friction in the piston and the mast, actual weighing accuracy will be from 1% to 2% of the scale capacity for lift trucks. **THIS SCALE IS A WEIGHT ESTIMATOR AND SHOULD NOT BE USED FOR COMMERCE.**



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email - psc@pacifier.com
Web - Pacific Scale Co. - www.pacificscale.com
- LNW Mfg. Dept. - www.forkliftscales.us



ORDERING INFORMATION

LOADER	LIFT TRUCK
1. Make:	1. Make:
2. Model:	2. Model:
3. Capacity:	3. Capacity:
4. No. of Lift Cylinders:	4. No. of Primary Lift Cylinders:
5. Inside Cyl. Dia.:	5. Inside Diameter Primary Cylinder:
6. Distance "A":	6. Lift ratio:
7. Distance "B":	To establish lift ratio raise ram 12" If forks raised 12", ratio is 1:1. if 24" ratio is 2:1, etc.
Equipped with: <input type="checkbox"/> Bucket <input type="checkbox"/> Forks	
8. Voltage:	7. Voltage:

Warranty

Pacific Scale Co. warrants to the original purchaser that it will repair or replace any part which in its judgement is defective in material or workmanship. Warranty period is 365 days from date of shipment.

Special 5 year warranty on Main board electronics if found to be defective in material or workmanship. See owner's manual for complete warranty and return instructions.

Distributed by:

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Important Notice

Your new LNW-5, Serial No. _____, was calibrated for installation on a Make _____ Model _____ before leaving the factory.

Please read the Operating Instructions on page 4 and the Troubleshooting chart on page 7 before attempting to re-calibrate the indicator.

**Do NOT spend over 30 minutes
in testing and adjusting.**

**If you spend more time than this or are having problems,
please call for technical assistance
1-800-537-1886**

If you call, please have available:

1. LNW Indicator Serial number _____.
2. Make (Truck) _____.
3. Lift capacity of the vehicle _____.
4. Number of Lift cylinders _____.
5. D.C. voltage supplied by the truck _____.
6. Description of the problem.

**** CAUTION ****

Safety First

Because Lift trucks can vary greatly in their configuration from Manufacturer to Manufacturer and model to model, the instructions for installation of the indicator are general in scope. A qualified lift truck technician may find an alternate means to install the scale which is better suited to the situation.

Pacific Scale Co., Inc. strongly recommends that when installation procedures are followed which depart from those outlined herein, the safety of personnel and equipment must be accorded primary consideration.

Dry Packs

LNW Scales are designed with gaskets to be weather tight, as well as having heavy duty cast aluminum cases. However, they are NOT hermetically sealed and in a changing weather environment, (heat and cold, humidity) moisture may be drawn into the case. When manufactured and shipped, the LNW units include “Dry-pack” desiccant packages internally to absorb the moisture that is drawn into the case.

Your LNW scale unit should be checked periodically to insure that the “Dry-pack” desiccant packages are still dry enough to absorb moisture or be replaced. If unable to locate desiccant locally, contact Pacific Scale to purchase more .

DC Power Filters

Pacific Scale Co. builds LNW Indicators for use on a wide variety of equipment and vehicles. Our Wide Input Voltage Regulator (WIVR) will work on an input voltage of 12-48 volts DC and has basic power line noise filtering built in.

Depending on design, some vehicles, particularly electric forklifts, may need additional external power filtering to protect our LNW indicators from surges and power spikes that may damage our WIVR.

We can pass along suggestions from what our customers have used, but each end user must determine what their particular equipment requires to provide adequate power.

Due to recent electrical design changes on forklifts, Pacific Scale cannot guarantee that our LNW units will work as is without external power filters and conditioners supplied by the customer or with the filter and regulator we have provided

Pacific Scale Co. has included with this LNW unit;

1 - SM480-8 Heavy Duty DC Power line filter (HDLF)

1 - SM2412-25 Heavy Duty Voltage regulator (HDVR)

If the customer wishes to use his own filters, or if the Heavy Duty external filter and Regulators we have provided are not needed, please return the Heavy Duty filter and regulator for \$25 credit to:

Pacific Scale Co., LNW Mfg. Dept., 16002 SE 106th, Clackamas, OR 97071

The End User and/or Installer should use their experience and vehicle dealers suggestions on the need for additional power filters and conditioners.

One source for vehicle mounted power conditioning equipment is www.servicemate.com

We hope each customer who solves a particular problem can share their experience with our tech dept. to pass along to new customers via our www.forkliftscales.us website.

For further information contact LNW Tech Support at 1-800-537-1886 ext. 109
Or email: tech@forkliftscales.us

Introduction

Your new LIFT-N-Weigh Model LNW-5 was designed to provide you with a reliable, versatile and compact weighing system. While there are a number of variables affecting the hydraulic system pressure - fluid viscosity, temperature, mechanical friction, leaking seals, etc. - this manual is intended to show you how to get the best performance out of your LIFT-N-WEIGH.

Description

PRINCIPLE OF OPERATION - The lift truck scale works on the principle that the lift truck hoisting pressure is directly proportional to the applied weight on the forks. The hydraulic pressure is converted into an electrical signal by a pressure transducer. After completion of the calibration procedures, the reading on the display is the weight on the forks.

PRESSURE TRANSDUCER - The transducer uses a strain gage bridge to convert the hydraulic pressure in the lifting cylinder into a proportional electrical output. This unit is capable of sensing pressure from 0 PSI to 5,000 PSI at full scale. The transducer is built into the indicator enclosure for maximum protection and easier installation. A high pressure hose from the Lift truck (see Installation diagram page 3) connects to a 1/4" NPT female swivel fitting on the back of the Indicator housing.

DIGITAL INDICATION - The LNW indicator uses solid state technology to achieve a high degree of accuracy on the Test bench. This, however, is downgraded by the friction in the lift truck. Fork load is displayed on a backlighted Liquid Crystal Display for easy viewing in both bright and poorly lighted situations.

HOUSING - The unit is housed in a heavy cast aluminum housing to help protect it against mechanical damage. All openings are gasketed and sealed to minimize contamination from dust and moisture. *(Note: Moisture can be drawn into case. Customer must check periodically.)*

POWER REQUIREMENTS -

12 through 48 Volts DC

NOTE: *If power to a unit normally drops below 11.5 volts, the Wide Input Voltage regulator may need to be bypassed for proper operation.*

NOTE: *Units before Serial Number #5660 need the special shunt (jumper) removed for use above 12 Volts DC - See board outline on page 5*

Installation

LIFT TRUCK CONDITION - To achieve the best accuracy possible, approximately +/- 2% of the capacity of the truck or better, the lift truck should be in good mechanical - hydraulic condition. The lifting mechanism must be checked for satisfactory operation: leaks; proper fluid level; the mast slides for worn or bent sections and mast rollers for worn bearings; hoist piston and ram seals for wear; insure mast slides are clean and lubricated.

INDICATOR INSTALLATION - Mount the indicator bracket to facilitate viewing and necessary clearances for adjustments (mounting bolts are provided). Connect the power cable to power sources. White lead should go to Positive and the Black to Negative. CONNECTIONS SHOULD BE MADE DIRECTLY TO THE BATTERY TO AVOID ELECTRICAL NOISE.

Note - *For Units before #5660, if the power source is above 12 VDC, remove the HI-V jumper per the drawing on Page 5.*

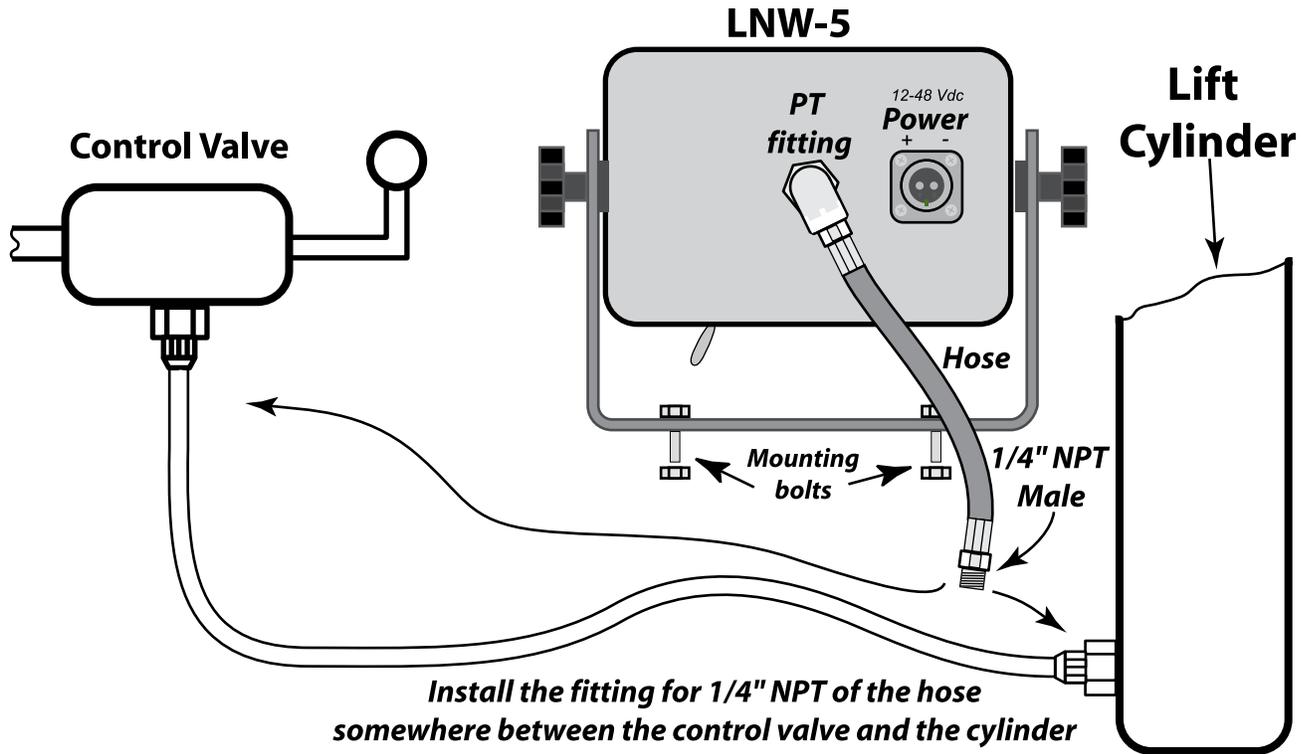
HOSE INSTALLATION - The 6' hose is connected between the lift valve and the primary lift cylinder(s). The Indicator is located so the other end of the hose can connect to the fitting on the back. Locate the indicator so hose and electrical cable are clear of moving parts and display can be seen by the operator.

(See page 3 - Installation outline drawing)

- a. Before loosening hydraulic fittings, insure the release of hydraulic pressure by lowering the forks to the ground.
- b. Somewhere between the lift valve and the lift cylinder(s) install a fitting that will accept the 1/4" NPT male on the end of the hose. Remember the indicator must see the pressure in the main cylinder when lifting a load so watch for any pressure bypasses. If truck has two (2) lift cylinders, be sure you install the hose so pressure is read from both cylinders.
- c. With the appropriate fitting installed between the lift cylinder and the valve, install one end of the hose at the fitting and tighten. Attach the other end of the hose to the fitting on the indicator. Before tightening, pressurize the system and bleed air from the hose.
- d. Start the lift truck and check for leaks.

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Installation Diagram



Operation

WEIGHING REFERENCE POINT - A point established for all zeroing and weighing. This point must be within the freelif portion of the uprights.

FIRST STAGE CYLINDER - The LIFT-N-WEIGH will weigh accurately only in the first stage on a truck telescoping hoist cylinders.

WEIGHING HEIGHT - To set the weighing height:

- a. Raise forks approximately 16" above ground level.
- b. Apply one (1) of the supplied red Arrow decals to the mast, within clear view of the operator, and another to the fork carriage directly opposite the first mark, also within clear view of the operator.

REPEATABILITY IS THE KEY TO GOOD WEIGHMENTS - Pick up the forks about 18"-20" and lower about 2" - then set Zero - repeat procedure several times to assure that display repeats within 2% of truck capacity. (+/- 100 Lbs. on a 5,000 Lb. truck) - Do NOT keep readjusting zero if it repeats within the 2% range. Pick up a load in the same manner and see if it repeats within 2% of truck capacity.

If display repeats but the weight is wrong, go to page 5 and follow the calibration instructions.

Note: 16" is given as a convenient height. If repeatability is better at another level, change the reference marks. Weighing must be in the first stage. It really doesn't matter how it is done, as long as you get repeatability at Zero and with a load - all within 2% of truck capacity,

Description of Controls - (2 only)

ZERO KNOB: Located on bottom left side of housing.

ON/OFF SWITCH: Located on bottom right side of housing.

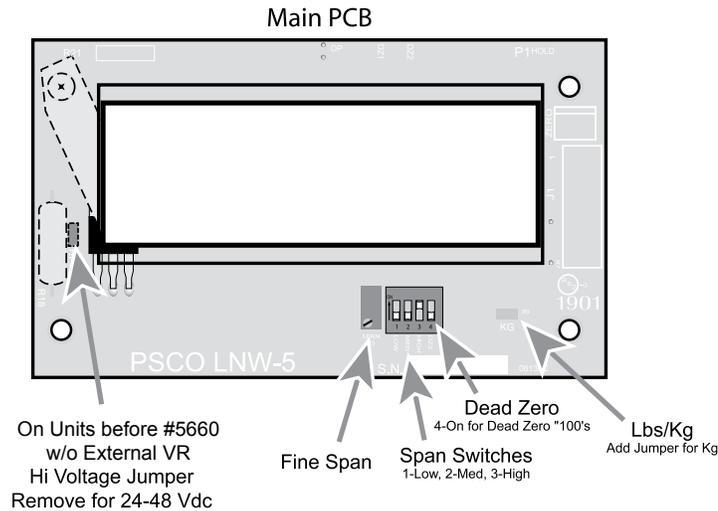
OVERLOAD INDICATION - Since the LNW-5 can only display upto 19,990 x 10 or 199,900 x 100, exceeding these will be indicated by either a "1 0" or a "1 00" on the display.

WEIGHING PROCEDURE (SUGGESTED)

1. Bring mast to vertical position.
2. Raise forks 2" or so above weighing mark.
3. Jog forks down to mark and adjust ZERO knob until display reads Zero. ZEROING and WEIGHING must be done in the same manner and at the same point.
4. To weigh a load, lift the load in the same manner as when setting Zero - 2" above the mark and jog down to the mark. When display pauses or hesitates, read the weight. The pause will normally be just momentary.
5. Recheck your ZERO occasionally during use. Reset if it has changed.

Note: If above method does not give repeatable readings, see Steps 1 & 2 Page 5.

Calibration Adjustments



The Lift-N-Weigh is normally pre-calibrated to the customer supplied lift truck specifications. This is a test bench calibration to the calculated pressure. Because of friction in the lifting mechanism and control valve bleedback, weight errors may exist in the system when installed on the customers equipment. These can often be easily corrected by performing the following adjustments:

Step 1. Lift the forks at normal lifting speed to 18" to 24" height and lower (jog down) a couple of inches. Wait until the numbers on the display pause or hesitate (usually 3-7 seconds) to take a reading. Do this several times to insure the zero setting is correct **DO NOT BE CONCERNED WITH AN ERROR WITHIN 2% OF THE TRUCK CAPACITY.**

(e.g.. tolerance for a 5,000 lb. truck capacity @ 2% = 100 lbs.error plus or minus.)
If the empty (ZERO) weight repeats within 2% proceed to Step 2.

If the empty weight readings **DO NOT** repeat within 2% tolerance, try lifting the forks to the weighing height - 16" to 20"- and take your readings as soon as you release the lift valve - do not lower. Try any method that will give you repeatable readings within the 2% tolerance.

Step 2. Lift a known weight equal to approximately 1/2 of lift truck capacity or more. Raise the load in the same manner as when setting zero (Step 1). Do this several times to insure that the system repeats within the 2% tolerance. Repeatability is the key to good weighments.

IF THE WEIGHT READINGS DON'T REPEAT WITHIN THE 2% TOLERANCE (OF CAPACITY), TRY A DIFFERENT METHOD OF LIFTING. IF A DIFFERENT METHOD WORKS, REMOVE THE LOAD AND RECHECK ZERO USING THE SAME METHOD. IT DOESN'T MAKE ANY DIFFERENCE HOW THE WEIGHMENTS ARE DONE AS LONG AS THE ZERO AND WEIGHT READINGS ARE DONE IN THE SAME MANNER AND THE WEIGHTS REPEAT WITHIN TOLERANCE.

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CALIBRATION INSTRUCTIONS - CONTINUED

Step 3. If the weighments repeat within tolerance and are correct - Start using the LIFT-N-WEIGH. If the weighments repeat but are the wrong weight, proceed with Step 4.

Step 4. Remove the six (6) stainless screws from the front cover. Remove the cover and the cover gasket exposing the board with the display. Check Zero setting then lift the known weight. With the fine blade screwdriver, adjust the FINE SPAN potentiometer (*see diagram previous page*) counterclockwise to RAISE the weight reading and clockwise to LOWER the weight reading. Do not worry about turning it too far as it has an internal clutch that clicks when you are at the limit of adjustment. If the correct weight reading cannot be reached with the potentiometer, turn it in the opposite direction about 10 turns and turn on or off the span switches next to it - starting with Number 1. ON will increase the weight readings.

Note: The LNW-5 is normally shipped with position 3 -"High Span" ON. To reduce Span range, turn position 3 OFF and position 2 ON. Then adjust the Fine Span Pot to get a correct reading.

If still too high, turn Position 2 OFF and Position 1 ON. Then adjust the Fine Span Pot to get a correct reading.

Step 5. When you make a change in the weight adjustment, lower the forks and re-lift to the weighing height. The easing off of the friction in the lifting system causes the weight to drop over time.

Step 6. Remove the load and recheck the Zero setting. If Zero is still within tolerance - Start using the LIFT-N-WEIGH.

REMEMBER - Repeatability & consistency are the key to good weight readings.

Calibration should take less than 30 minutes.

***Should you have any problems
call 1-800-537-1886***

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Trouble Shooting

Malfunction	PROBABLE CAUSE	CORRECTIVE ACTION
INDICATOR DOES NOT DISPLAY NUMBERS	<ul style="list-style-type: none"> •Power leads reversed. •Power not connected. •Defective Indicator •LCD out of socket 	<ul style="list-style-type: none"> •Connect White to Positive, •Connect Black to Negative •Connect per instructions •Replace Indicator or plug •Place the LCD in its socket
INTERMITTANT OPERATION	<ul style="list-style-type: none"> •Electrical Fault in Main Board or Voltage Regulator 	<ul style="list-style-type: none"> •Return for repair •(Call for RMA)
INDICATOR READINGS DO NOT CHANGE	<ul style="list-style-type: none"> •Transducer connected to wrong side of valve •Hydraulic Hose obstruction •Loose hydraulic connection 	<ul style="list-style-type: none"> •Reconnect to output of valve •Repair or Replace hose •Tighten couplings
INCONSISTENT WEIGHT	<ul style="list-style-type: none"> •Inconsistent weighing procedure •Inconsistent Zero setting •Leaking Hoist cylinder •Air in hydraulic system •Mast not upright •Hoist cylinder fluid low •Mast slides dirty •Mechanical system worn/bent •Friction in cylinder, rollers, slides, etc. 	<ul style="list-style-type: none"> •Follow recommended method •Follow proper procedure •Repair •Bleed system •Weigh & Zero w/Mast upright •Add proper amount of fluid •Clean & lubricate •Repair as required •Lubricate mastparts & be sure load on forks is against the carriage
FINE SPAN POT SCREW DOES NOT ADJUST DISPLAY	<ul style="list-style-type: none"> At least one of the three Span switches, #1, #2, #3 is not "ON" 	<ul style="list-style-type: none"> •See section on calibration
DISPLAY NUMBERS JUMP UP & DOWN ERRATICALLY OR HASH IS DISPLAYED	<ul style="list-style-type: none"> •Electrical interference caused by: Bad ignition system, rotating light, etc. 	<ul style="list-style-type: none"> •Clean or replace plugs; check wiring & replace if needed; clean noisy contacts, etc.
MOISTURE ON INSIDE OF LENS	<ul style="list-style-type: none"> •Check cover gasket & screws 	<ul style="list-style-type: none"> •Tighten screws & or replace gasket

IF PROBLEMS STILL EXIST

CALL THE **PACIFIC SCALE CO. SERVICE DEPARTMENT**
1-800-537-1886 EXT. 109

Warranty

Pacific Scale Co., Inc. warrants to the original purchaser that it will repair or replace - at its option - any part which in its judgement is defective in material or workmanship. Such repairs or replacements shall be performed without charge at Pacific Scale's service facilities.

The defective unit is to be returned to Pacific Scale Co., Inc. prepaid with a description of the problem, after calling and receiving a **RETURN MATERIAL AUTHORIZATION** (RMA) number. No unit will be accepted for Warranty without an RMA number.

This warranty covers:

Entire unit for a period of one (1) year;

Main electronics board for a period of five (5) years;

from the date of shipment from Pacific Scale Co., Inc. and is subject to the following limitations:

Limitations: This warranty shall not apply to -

a. Damage which in the opinion of Pacific Scale Co., Inc. is the result of overloading, misuse, water damage, negligence, alteration, accident or service performed by other than Pacific Scale Co., Inc. authorized personnel.

b. The replacement of expendable or consumable parts.

c. Normal deterioration due to wear or damage and deterioration due to extended storage or exposure while in the purchaser's possession before installation.

This Warranty is the only warranty expressed or implied. Pacific Scale Co., Inc. neither assumes nor authorizes any other person to assume for it any other obligation or liability. Pacific Scale Co., Inc. will not be responsible or liable for any consequential or contingent damages and its liability is limited to the original purchase price of the equipment sold.

Parts List, (partial)

Description	QTY	Part NO.
Bezel, Silkscreened	1	L5-BZ
Bezel Gasket	1	L5-BZ-G
Bezel screws	6	L5-BZ-S
Hose, high pressure synthetic, 6', 1/4" NPT Male each end	1	LC-HH-72
Hose Fitting, 360 Deg. swivel ell	1	LC-PT-FS
Install Kit (Includes Power Cord, Scotchlok taps, Bolts & Nuts, and misc.)	1	L5-Install Kit
Main Board, (for use with external VR - #5660 on)	1	L5-MB-VR
ON/OFF Power Switch, toggle	1	L5-PS-ASSY
ON/OFF Power Switch Boot	1	LC-SW-B
Power Cord Assy	1	LC-PC-ASSY
Pressure Transducer	1	LC-PT
U-Bracket Mount (w/Knobs)	1	L5-UB-ASSY
U-Bracket Knobs, Black.....	2	LC-UB-KB
Voltage Regulator Assy	1	WIVR
Zero Knob (w/o gasket)	1	L5-ZP-ASSY
Zero Knob Gasket	1	L5-ZP-G