

*Precision Mobile Scales*

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# LTS SCALE



MANUFACTURE OF FILING

## Lift Truck Scales

WITH

DR2100A INDICATOR

**TECHNICAL MANUAL**

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(Blank Page)

<b>Owner Statistics</b>		5
<b>Warranty</b>		6
<b>Technical Bulletin</b>		7
<b>Lift Truck Scale Installation</b>		9
1. Unpacking		9
2. Scale Base Installation		9-10
<b>Figures 1 – 4</b>		11-12
3. Side Shift Bracket Installation		13-14
4. Indicator Installation		15-16
<b>Base Adjustment, Service and Repair</b>		17
5. Flexure Replacement and Adjustment		17
6. Top Flexure		17
7. Bottom Flexures		17
8. Final Adjustment of Flexure Retaining Plates		18
9. Scale Balancing - Adjusting Heal-to-Toe Shift		18
10. Load Cell Removal		19
11. Load cell Replacement Re-assembly		20
<b>DR2100A Technical Manual</b>		21
<b>General Information</b>		23
1. Standard Features		23
2. Indicator Options		23
3. Display Description		23
4. Keyboard Controls		24
5. Operation Sequences		25-26
6. DR2100A Keyboard Layout		27
7. Main PC Board Layout		27
9. Connector Pin Outs - Main Board		28
8. Operating Voltage - Filter Board		29
10. Load Cell Cable Pin Outs	<b>Standard</b>	30
11. Load Cell Cable Pin Outs	<b>NTEP</b>	30
12. Set-Up Code Screens	<b>Standard</b>	31-33
13. Set-Up Code Screens	<b>NTEP</b>	34-36
<b>Indicator Setup</b>		37
14. Configuration Codes		37
15. Code 2100 – Keyboard Lockout		38
16. Code 2104 – Expand Test Mode X10		38
17. Code 2105 – Restore Default Name		38
18. Code 2169 – Load Default Settings		39
19. Code 6969 – Initialize Clock Chip		39
20. Code 9080 – Indicator Setup		39-40
21. Code 9081 – Four-Point Calibration		41
22. Code 9082 – Configure Setpoint Mode		41
23. Code 9083 – Configure Remote Inputs		41
24. Code 9084 – Configure Print		41-42
25. Code 9085 – Setting Time & Date (Optional)		42-43
26. Code 9086 – Reset Scale Zero		43
Keyboard Test & Raw A/D Test		43
27. Code 9087 – Entry of Setpoint Values		43
28. Code 9088 – Entry of Average Part Weight		44
29. Code 9089 – Program Name Through Serial Port		44
30. Code 9090 – Single-Point Calibration		44
29. Code 9091 – Filter Band	<b>Standard</b>	45

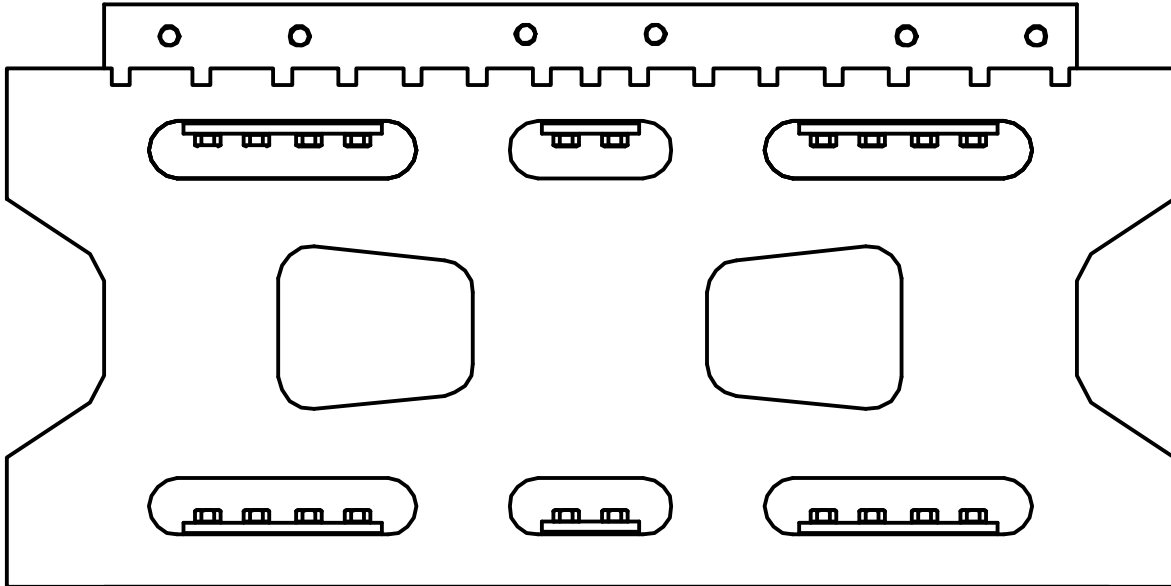
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View Store Cal. Factors	<b>NTEP</b>	45
32. Code 9092 - View Store Cal. Factors	<b>Standard</b>	45
Angle Zero and Span Factors	<b>NTEP</b>	
33. Code 9093 – View / Set Angle Factors	<b>NTEP</b>	45
34. Code 9094 – Out-of-Level Calibration		45
35. Code 9095 – Print Calibration Factors		45
<b>Calibration</b>		
36. Code 9090 – Single-Point Calibration		47
37. Code 9081 – Four-Point Linearity Calibration		48
38. Out-of-Level Calibration	<b>NTEP</b>	49-50
39. NTEP Calibration Verification	<b>NTEP</b>	51
40. Calibration Numbers		52
41. Angle Cal. Numbers	<b>NTEP</b>	53

# Owner Statistics

Please enter the appropriate base and indicator serial numbers prior to installation.  
Please refer to the numbers below for information, orders or service.

## Scale Base



<b>Indicator Model #</b>

<b>Indicator Serial #</b>

<b>Base Model #</b>

<b>Base Serial #</b>

<b>Capacity x Grad.</b>

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<b>Top Flexure</b>

<b>Part Number</b>

<b>Quantity</b>

<b>Bottom Flexure</b>

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# ***LTS SCALE CORPORATION***

## **CERTIFICATE OF WARRANTY**

The high quality equipment sold and manufactured by LTS SCALE CORPORATION is warranted against defects in materials and workmanship, for a period of 24 months from the date of installation or 26 months from the date of shipment to the buyer, whichever occurs first. LTS SCALE warrants to the original purchaser that they will repair or replace, at their option, any product that is defective in the opinion of LTS SCALE. This warranty is limited to the repair or replacement of defective parts and the associated labor for the repair of same. All labor must be performed by authorized personnel and is limited to the conditions set forth in the Distributor Warranty Policy. Reasonable travel time and mileage (not to exceed 100 miles) will be included and covered by this warranty for the first 90 days of the warranty period. After the first 90 days of this warranty period the buyer is expected to pay all travel time and mileage to and from the job site. This warranty does not apply to damages resulting from equipment which is not installed in accordance with manufacturer drawings, recommendations and specifications. Nor shall it apply to any equipment that has been subject to abuse, accident, alteration, unreasonable use, neglect, lack of proper maintenance, or other causes not arising out of defects in materials or workmanship. This warranty does not apply to normal maintenance services such as normal wear and tear, periodic inspections, and calibration. Specialty designed equipment is not covered by this warranty. LTS SCALE will not be responsible or liable for consequential, collateral claims, or any losses which result from performance of equipment covered by this warranty. This warranty constitutes LTS SCALE CORPORATION'S exclusive warranty, there being no other warranties expressed or

# ***LTS SCALE CORPORATION***

## **EXCLUSIVE**

## **LOAD CELL WARRANTY**

LTS SCALE CORPORATION is proud to offer an unparalleled lifetime load cell warranty. LTS SCALE warrants to the original purchaser that we will repair or replace, at their option, any load cell that is defective in the opinion of LTS SCALE for the life of all standard lift truck scales. This warranty includes the reasonable amount of labor associated with this repair or replacement. Authorized personnel must perform all labor and is limited to the conditions set forth in the distributor warranty policy. Reasonable travel time and mileage (not to exceed 100 miles) will be included and covered by this warranty for the lifetime of the scale. All of the standard warranty exclusions set forth by the LTS SCALE CERTIFICATE OF WARRANTY will apply. This warranty constitutes LTS SCALE CORPORATION'S exclusive warranty, there being no other warranties expressed or implied in law or in fact including implied warranties of fitness or merchantability.

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# TECHNICAL BULLETIN

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Subject: Safety Plate Retaining Bolts & Flexure Bolts

When installing or servicing an LTS Scale Corporation Lift Truck Scale it is critical that the **safety plate retaining bolts** are torqued properly. The correct torque value for these bolts is **125 ft-lb**.

When replacing or servicing the **flexures** on an LTS Scale Corporation **Lift Truck Scale** or **EnviroScale** it is critical that the bolts are torqued properly. The correct torque value for these bolts is **125 ft-lb**.

**WARNING:** *Failure to properly torque the Safety Plate Retaining Bolts may result in Bodily Harm or Damage to the Equipment.*



*Failure to properly torque the flexure bolts can result in future flexure failure.*

Please contact LTS SCALE CORPORATION Technical department at 1-800-423-4827 with any questions or comments.

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# **Technical Bulletin**

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Subject: Proper Power Requirements

***When installing or replacing the power cable on a LTS Scale Corporation Lift Truck Scale it is critical to perform the following precautions.***

1. The power cable must be connected directly to the battery.
2. The power cable must be isolated from the spark plug wires and coil.
3. **Most importantly, Carbon Cloth Noise Suppressed Wires** must be installed on the truck. Trucks with stainless steel or copper wires generate the highest levels of transient noise, which can cause the indicator to “lock-up.” Carbon Cloth Noise Suppressed Wires virtually eliminate indicator lock-ups, and can be purchased from most auto parts supply stores.

Warning: Failure to have the proper spark plug wires on the truck, or to properly route the power cable can result in future indicator failure.

Contact LTS Scale Corporation technical support team at (800) 423-4827 with any questions.

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# LIFT TRUCK SCALE INSTALLATION

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## **1. Unpacking**

The Filing Lift Truck Scale is shipped on a pallet. A standard system will include the following components:

1. One (1) scale carriage assembly with safety plates.
2. One (1) load cell cable assembly with mounting bracket.
3. One (1) power cable.
4. One (1) plumb-bob level (not with NTEP Models).
5. One (1) electronic indicator with mounting hardware.
6. One (1) Operator / Installation manual.
7. One (1) Side Shift Bracket (Option).

Upon receipt of shipment, inspect to make sure the above listed parts are present.

## **2. Scale Base Installation**

- 2.2. Remove safety plate(s) from bottom of scale carriage assembly. Place the scale in a vertical position on the edge of the shipping pallet, with the rear side outward. Examine the back plate of the scale base at this time to locate the carriage alignment bolts per figure #1. The head of a bolt that protrudes from the rear of the scale is known as the fixed carriage alignment bolt. There are also several adjustable carriage alignment bolts protruding from the rear of the scale. These adjustable bolts have a red lock nut located between the two plates. The number of adjustable carriage alignment bolts varies from as few as two (2) and as many as six (6) on some NTEP models. These bolts will be adjusted in step #4.

**Note: If the lift truck has a take-up-reel device ensure that the Load Cell Cable Mounting Bracket is located on the opposite side of the lift truck. Relocate the longer mounting bolt to the correct side of the base prior to installing the base.**

- 2.3. Remove forks from the lift truck, and position the truck behind the scale assembly. (Refer to Figure #2.)

**Warning: To avoid bodily harm care must be exercised while handling the scale base prior to applying the safety plates.**

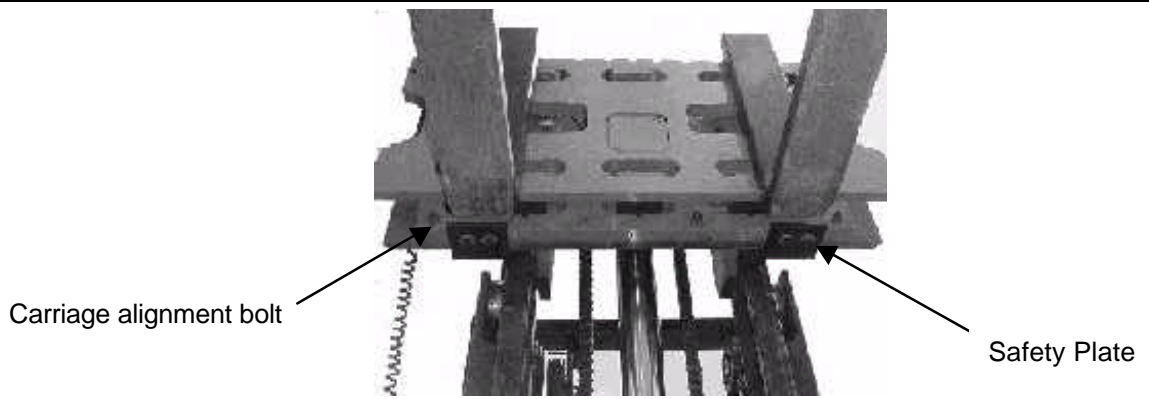
- 2.4. Raise or lower the lift truck carriage and tilt the mast forward to a position that aligns the anti-shift pin on the scale assembly with the center notch on the lift truck carriage (Refer to Figure #2). Tilt the mast back to catch the scale assembly and carefully raise the carriage to a comfortable working position. Reattach the safety plates to the bottom of the scale assembly, so that the lip of the safety plate is behind the original carriage.(Refer to Figure #3).  
**Torque the Safety Plate Retaining Bolts to 125 Ft-Lbs.**

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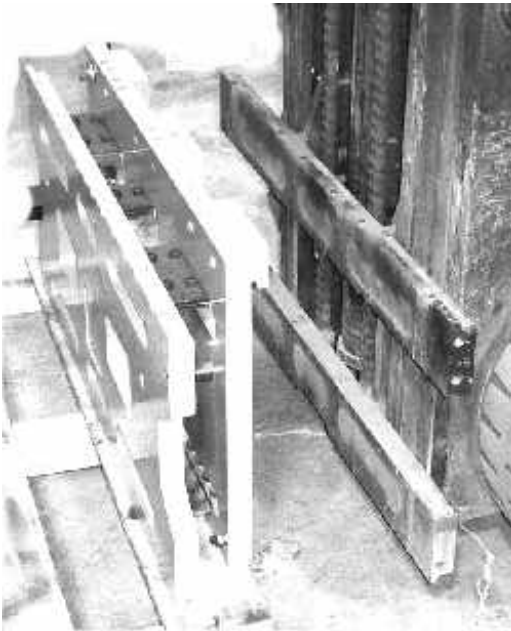
**Warning: Failure to properly torque the Safety Plate Retaining Bolts may result in Bodily Harm or Damage to the Equipment.**

**Note: The Center Cleat with Anti-Shift Pin should be centered with the middle notch of the truck carriage. Verify that the Anti-Shift Pin is adjusted so that the Pin is located well within the center notch area of the carriage. DO NOT OVERADJUST. The anti-shift pin should not touch the bottom of the notch on the original carriage, this will cause side to side tilting of the scale. To properly adjust the Anti-Shift Pin tighten the Pin down until it bottoms out then back the Pin off 1/8 of a turn.**

- 2.5. To assure firm and level mounting, the fixed carriage alignment bolt of the scale assembly should be resting on the lift truck carriage. To attain a secure mounting, loosen the lock nuts (painted red for easy identification), then back the alignment bolts off until the center pad is resting against the lift truck carriage. Next, adjust the carriage alignment bolts so that they are just touching the lift truck carriage, then tighten the lock nuts (Refer to Figure #1).
- 2.6. Remove the two (2) fork stop bolts, located in the upper corners of the front plate. Now reattach the lift truck forks to the scale assembly, and re-insert the fork stop bolts.
- 2.7. Attach the plumb-bob level to a stationary portion of the truck's mast. The plumb-bob level should be clearly visible to the operator at all times. Test to ensure that the forks are level and clear of the floor. In this position, the plumb bob is plumb (vertical) and should swing free.
- 2.8. Position the load cell cable assembly to either the right or left side of the scale assembly. Select the side opposite any hose or reel-type take-up device. Secure the load cell cable assembly to the longest mounting bolt. This bolt can be moved to either side of the scale (Note: A special load cell-mounting bracket is mounted at the factory for NTEP applications).



**Figure 1.**



**Figure 2.**

General view of scale on skid with forks detached ready for mounting.



**Figure 3.**

Attaching safety plate to bottom of scale assembly.

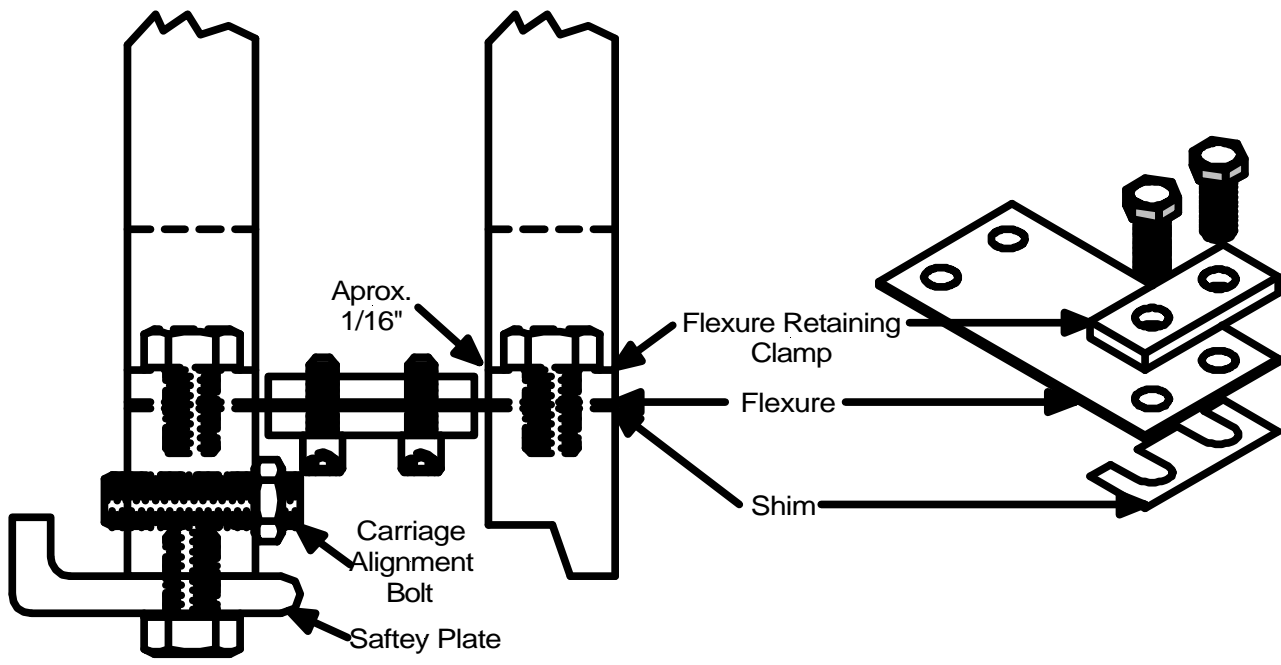
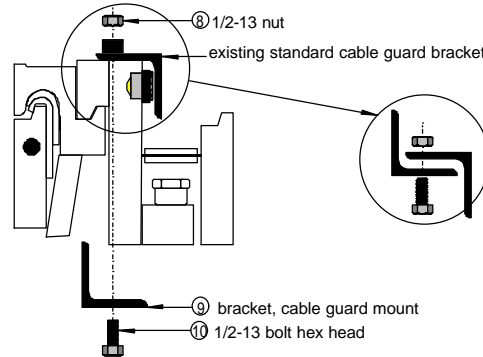


Figure 4

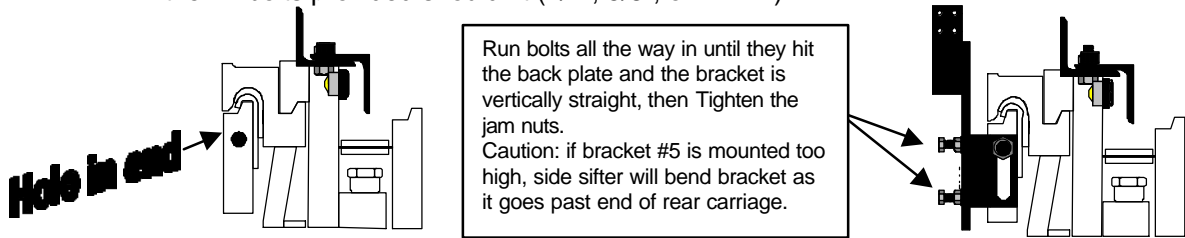
### 3. Side Shift Bracket Installation

- 3.1. Locate #9 (cable guard mounting bracket), to the bottom of the existing cable guard bracket using one of the two extra holes on the end of the existing load cell bracket. The cable guard bracket #9 must be mounted under the existing standard cable guard to keep the bracket from rotating.

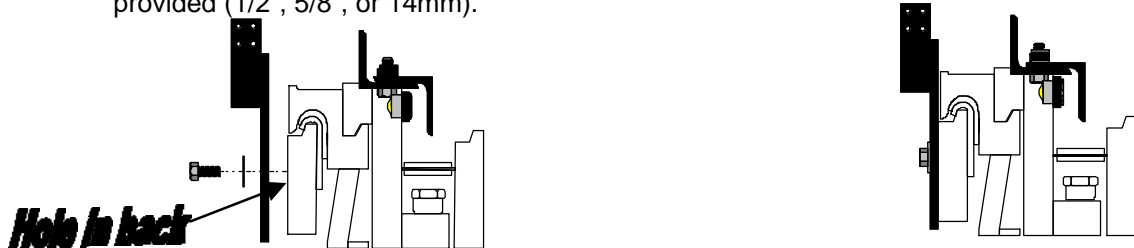


- 3.2. Inspect the rear carriage for pre-drilled and tapped holes on rear carriage.

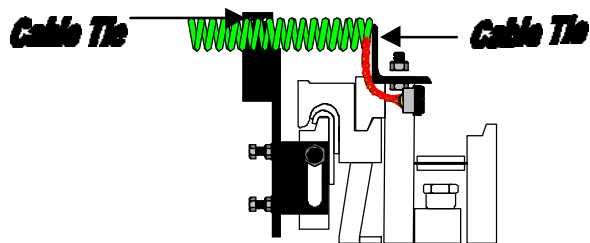
- 3.2.1. If there is a hole on the end of the carriage then use #5 (bracket, side shift angle). One of the #7 bolts provided should fit (1/2", 5/8", or 14mm).



- 3.2.2. If there is a hole on the back of the carriage then discard #5 (bracket, side shift angle) and attach bracket #1 (bracket, side shift) directly to the rear carriage using one of the #7 bolts provided (1/2", 5/8", or 14mm).

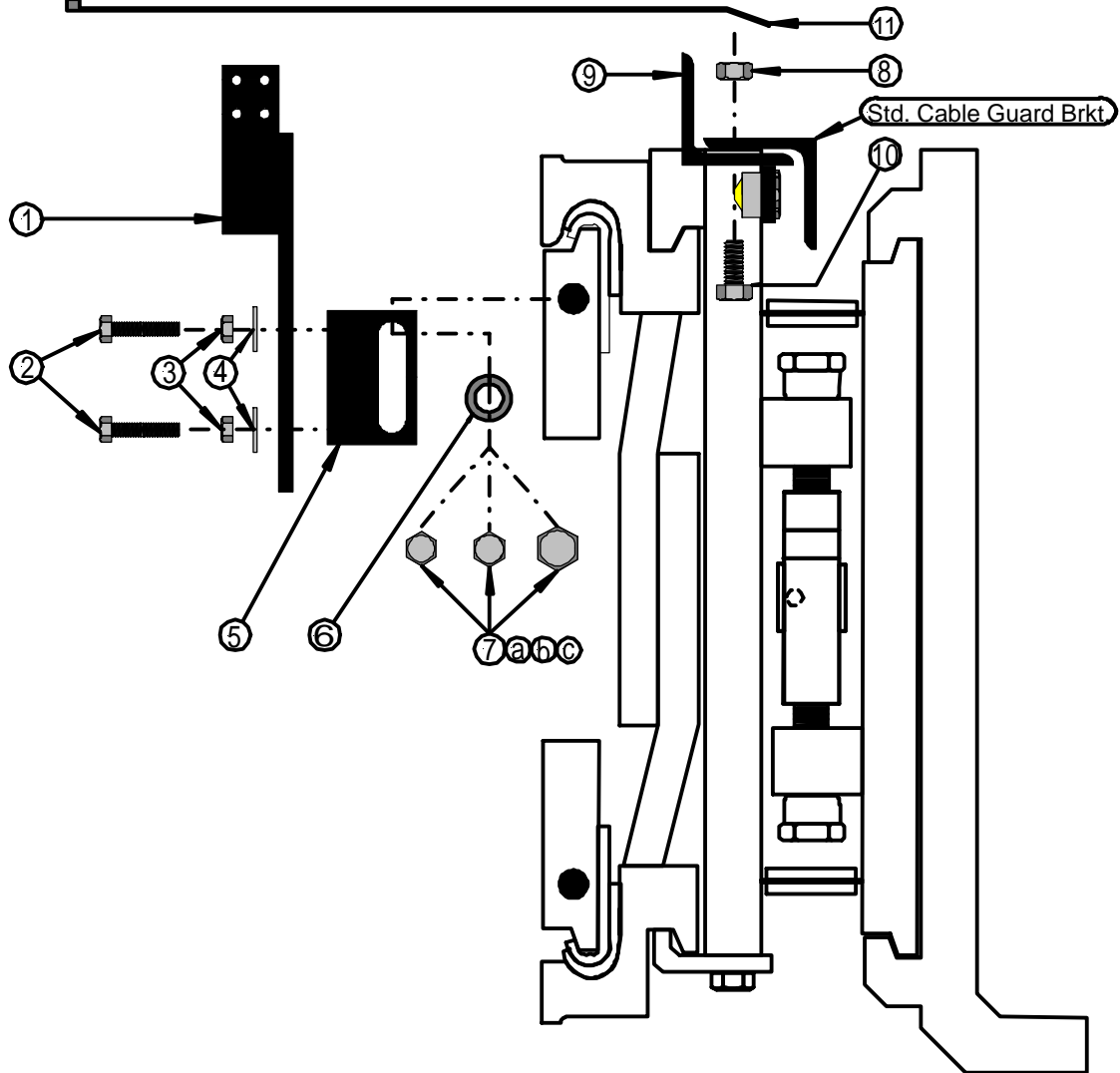


- 3.3. Use the cable ties provided to secure the load cell cable to the front and rear bracket. Operate side shifter all the way to the left and right and make sure there is enough cable slack left between brackets.



**Caution:** Operate side shifter slowly in both directions and up and down. Check clearance from moving parts. Make sure to leave enough slack in the load cell cable between brackets.

# Side Shift Bracket KOP – P.N. 3100 LT-K



Side Shift Bracket KOP – Part Number: 3100 LT-K			
Symbol	QTY	Part Number	Description
1	1	3100LT-2	Bracket, side shift
2	2	3082	5/16-18 x 1-1/2 bolt, hex head
3	2	3043	5/16 nut, hex head
4	2	3033	5/16 washer, flat
5	1	3100LT-1	Bracket, side shift angle
6	1	3048	5/8 washer, flat
7 A	1	3053	1/2-13 x 1 bolt, hex head
B	1	3054	5/8 x 1-1/4 bolt, hex head
C	1	3081	M14-1.5 x 25 bolt, metric, hex head
8	1	3065	1/2-13 nut
9	1	3100LT-3	Bracket, cable guard mount
10	1	3053	1/2 x 1 bolt, hex head
11	3		Nylon cable tie

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## **4. Indicator Installation**

- 4.1. Location of the indicator is a matter of operator preference. The universal-mounting bracket (included) enables it to be mounted to the safety cage or on the truck's dashboard. Mount the indicator at the preferred location using the supplied hardware. Run the load cell cable from scale assembly to the indicator, securing it with cable ties where necessary, but **DO NOT** plug connector into back of scale until power hook-up is completed. For most installations the load cell cable is secured with cable ties at the roll cage and at the top of the mast, however, each installation must be reviewed to determine the best method of securing the load cell cable. Slowly and carefully raise and lower the carriage and watch load cell cable for possible pinch points. Make sure there is enough slack in load cell cable if mast is fully extended. If scale has side shifter see installation instructions for installing side shift bracket

**Note:**        **Lift trucks that are equipped with side-shift require an extra bracket.**

- 4.2. Hook up power to the system. The power hook up procedure depends upon the type of lift truck, gas/propane or electric. Follow the respective steps:

**Note:**        **To avoid damage to the indicator it is necessary to ensure that the indicator is setup for the corresponding lift truck voltage. This input voltage is preset at the factory per the customer supplied voltage specification.**

- 4.2.1. **Gas/Propane Truck.** Run the power cable (two-conductor) from the indicator to the battery power supply of the truck. When routing the power cable avoid all contact with any moving or hot parts of the lift truck. The power cable is normally routed behind the dashboard or under the floor of the cab. Use wire ties to secure it in a safe position. Make sure all electrical connections match the polarity and voltage of the battery posts. Power cable inputs are white (+) and black (-). Ensure power cable is routed away from distributor cap, spark plug coil and spark plug wires. Failure to route cable away from these noise sources could cause intermittent operation or damage the indicator.

**Note:**        **Do not use instrument gauges for hook up. Due to internal impedance, this could cause indicator problems or failure.**

**Warning:**    ***Lift trucks with ignition systems (gas/propane) require carbon noise suppressed spark plug wires, and resistor-type spark plugs. Failure to have all parts installed correctly will damage the scale indicator. Also, copper or stainless wires on ignition systems will damage the scale indicator.***

- 4.2.2. **Electric Lift Truck.** Be sure the indicator is equipped for the proper voltage. Run the power cable (two-conductor) from the indicator to the battery of the truck. The power cable is normally routed behind the dashboard or under the floor of the cab. When routing the power cable avoid all contact with any moving or hot parts of the lift truck. Use wire ties to secure it in a safe position. Make sure all electrical connections match the polarity and voltage of the battery posts. Power cable inputs are white (+) and black (-).

**Important:**   **Connect the power cable inputs to the first two lugs coming off of the battery power supply. This will ensure that you are hooked up to a clean power supply and avoid damaging the equipment.**

**Warning:**    ***Electric lift trucks do not have a chassis ground. A connection using the chassis as a ground will damage the scale indicator.***

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- 4.3. Plug in the power cable and load cell cable into the back of the indicator. **Re-check the safety plates and fork stop bolts to be sure they are properly secured.** Turn the indicator ON and lift the forks off the ground. Carefully raise and lower the carriage and check the load cell cable to be sure it does not catch on anything. Use wire ties to secure the load cell cable in a clear position. Press “ZERO” key on the indicator. The indicator should zero and be ready for use. Forks must be in a level position to ensure accurate readings.

Do not make any calibration adjustments until the scale has been exercised several times, with a load of at least 50% of capacity. **After exercising the scale, repeat adjustment of the carriage alignment bolts.**

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# Base Adjustment

## Service and Repair

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### **5. Flexure Replacement and Adjustment**

In order to replace flexures, it is necessary to remove the entire scale assembly from the lift truck. Prior to replacing the flexures, perform the following steps:

- 5.1. Make sure the indicator is turned off.
- 5.2. Remove the forks from the scale assembly.
- 5.3. Disconnect the load cell cable from the indicator.
- 5.4. Remove the safety plates from the bottom of the scale and truck carriage.
- 5.5. Position the lift truck so that the scale assembly can be lowered onto a sturdy work surface. (A heavy gauge-shipping pallet works well.) Back the lift truck away from the work surface, leaving the scale assembly on the pallet in a vertical position. Secure the scale so that it does not fall.

### **6. Top Flexures**

- 6.1. If it is necessary to replace more than one flexure on the scale, be sure to remove and replace only one flexure (or set of flexures) at a time. When replacing a flexure, it is important to return all retainer clamps and any shims to their original position.
- 6.2. It may be necessary to use two large "C" clamps at the bottom to draw the scale assembly together. If clamping is necessary, **do not exert excessive clamping force.**
- 6.3. It may also be necessary to ream holes in the replacement flexures, to prevent bolts in flexure retainer clamps from binding.

**Note:** Do not tighten the flexure retainer clamps all the way. Positioning and tightening will follow in *Final Adjustment of Flexure Retaining Plates.*

### **7. Bottom Flexures**

- 7.1. Replacement of bottom flexures is more complex than the top flexures. Most shims used for achieving heel-to-toe balancing are located in the bottom row of flexures. Carefully remove flexures from the bottom row and look for shims beneath. **Shims must be returned to their original position between flexure and scale.** (Refer to figure 4.)
- 7.2. After all lower flexures are replaced and shims are in proper locations, tighten all lower bolts on the retainer clamps, **but do not tighten them completely.**

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## **8. Final Adjustment of Flexure Retaining Plates**

- 8.1. Place two “C” clamps on the bottom of the plate assembly between center and outer flexures and tighten the clamps. Locate the two stop-bolts and back them out so they are tight against the front plate. Check to ensure that all flexure-retaining clamps are flush with the front plate. Do not allow the retaining clamps to extend beyond the surface of the front plate. When all retaining clamps are flush, torque all bolts to approximately 125 ft.-lbs.
- 8.2. After all flexure retainer bolts have been tightened, inspect flexure support clamps to determine that a gap of approximately 1/16-inch is maintained between both ends of the support clamp and the inside of the plate assemblies. It may be necessary to either reposition the support clamp, or to remove and grind (either side of) the clamp to give the approximate 1/16-inch gap. If grinding is necessary, remove the entire support clamp (top and bottom) and grind together as one unit.
- 8.3. Inspect again to ensure that no flexures are extending beyond the surface of the front or rear plate. If a flexure extends beyond a plate surface, grind off until surface is flush.
- 8.4. Remove “C” clamps and reinstall scale on lift truck (refer back to the installation procedure). Exercise scale with a load approximately 50% of scale’s capacity prior to calibration and testing.

## **9. Scale Balancing - Adjusting Heal-to-Toe Shift**

- 9.1. Heel-to-toe or shift in weighing may be adjusted by adding or removing shims between the lower flexures and front plate. If weight on heel of fork is higher than the weight on the toe (tip) of the fork, remove shims (if any) from the lower flexure on the front plate, or add shims to the lower flexure on the rear plate.
- 9.2. If the weight on the toe of the fork is higher than on the heel, add shims to the lower flexure on the front plate. One pound of error equals approximately 0.001-inch shim. Heel and toe adjustments can be performed at all three flexures on the front plate, by moving the forks on top of the flexure being tested (left, center, and right, respectively). Important: If you add or remove shims, exercise the scale and reset the carriage alignment bolts.

**Note:** On 15,000 lb. and 20,000 lb. units, shims may also be located on the top flexures.

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## **10. Load Cell Removal**

### **Tools required.**

Digital Voltmeter (capable of reading millivolts)

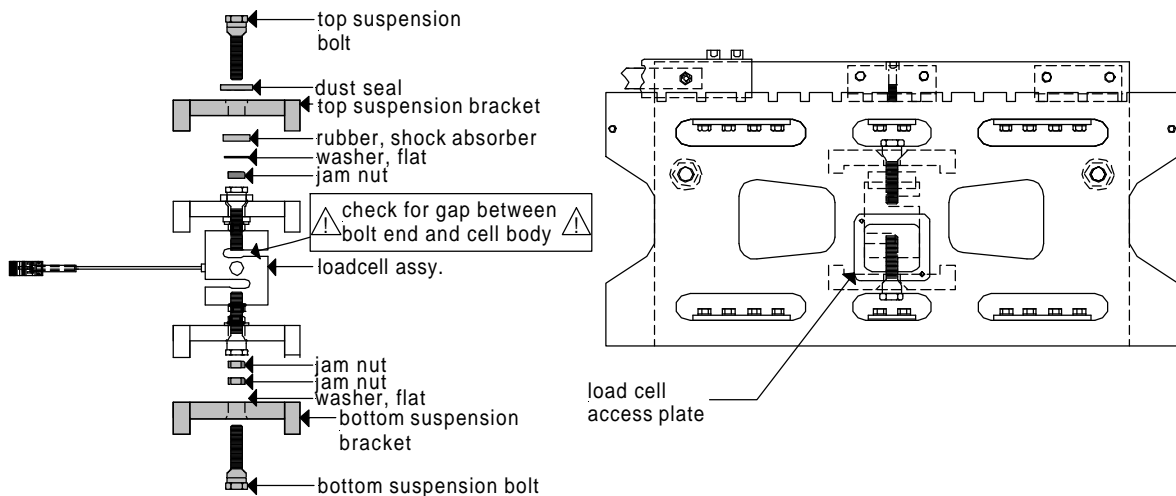
$\frac{3}{4}$  box Wrenches.

$\frac{3}{4}$  1-1/16", 1-3/8 open end wrenches

3/16" Allen wrench

Calibration instructions for indicator.

- 10.1. Turn indicator power OFF.
- 10.2. Disconnect load cell cable at indicator and the base.
- 10.3. Remove forks.
- 10.4. Remove load cell access cover plate (front-middle of scale).



- 10.5. Loosen Jam nuts at the bottom of load cell, 2 or 3 jam nuts depending on type of scale. Hold cell from turning and damaging load cell cable.
- 10.6. Remove Safety plate(s) on bottom of scale.
- 10.7. Remove scale from forklift.
- 10.8. Loosen jam nuts at the top of the load cell, 1 or 2 jam nuts depending on type of scale. Use the access slot in the back of the scale to hold load cell from turning.
- 10.9. Remove bottom center flexure. Observe mounting brackets, flexure and shim locations.
- 10.10. Remove bottom suspension bolt. Observe location off all nuts and washer.
- 10.11. Remove Top Suspension Bolt. Observe load cell height and location of all nuts and washer.
- 10.12. Remove load cell with cable. Note direction of load cell and cable. Dead-end of load cell to the top of the scale.

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## **11. Load Cell Replacement Re-assembly**

- 11.1. Install new load cell.  
Note direction of load cell and cable. Dead-end of load cell to the top of the scale.
- 11.2. Install top suspension bolt and hardware. Make sure top suspension bolt does not bottom out against the load cell center.  
**CAUTION: Bottoming out suspension bolt can damage load cell.**
- 11.3. Install bottom suspension bolt with hardware finger tight.
- 11.4. Tighten jam nut on top suspension bolt against load cell. Hold cell from turning.
- 11.5. Install bottom center flexure and hardware. Make sure shims are returned to same location and position as were removed.
- 11.6. Install scale base back on forklift.  
If not familiar with installing base in lift truck, review the installation instructions.
  - 11.6.1. Anti-Shift Pin should be centered with the middle notch of the truck carriage.
  - 11.6.2. Install safety plate(s). Plate(s) that keep scale from falling off. Tighten bolts to 125 ft/lbs.
  - 11.6.3. Adjust alignment bolts per scale installation directions.
- 11.7. Connect load cell cable at base end.
- 11.8. For indicator model:
  - 11.8.1. DR5000 disconnect signal leads at load cell (Green is + signal, White is –Signal).
  - 11.8.2. DR4500 disconnect signal leads at load cell. (Green is + signal, White is –Signal).
  - 11.8.3. DR2100 use test points inside indicator. See indicator manual for Main Board test points.
  - 11.8.4. DR2100A use test points inside indicator. See indicator manual for Main Board test points.
- 11.9. Set Voltmeter to read DC millivolts. Connect Voltmeter to:
  - 11.9.1. DR5000 disconnected signal leads at load cell (Green is + signal, White is –Signal).
  - 11.9.2. DR4500 disconnected signal leads at load cell (Green is + signal, White is –Signal) .
  - 11.9.3. DR2100 test points inside indicator. See indicator manual for Main Board test points.
  - 11.9.4. DR2100A test points inside indicator. See indicator manual for Main Board test points.
- 11.10. Power up the indicator.
- 11.11. Tighten bottom suspension bolt until voltmeter reads:

	DR2100 – DR2100A	DR5000	DR4500
Excitation	5 volts DC	8 volts DC	8 volts DC
MV preload	<b>1.2 mV</b> (.0012 volts DC)	<b>2.2 mV</b>	<b>2.2 mV</b>

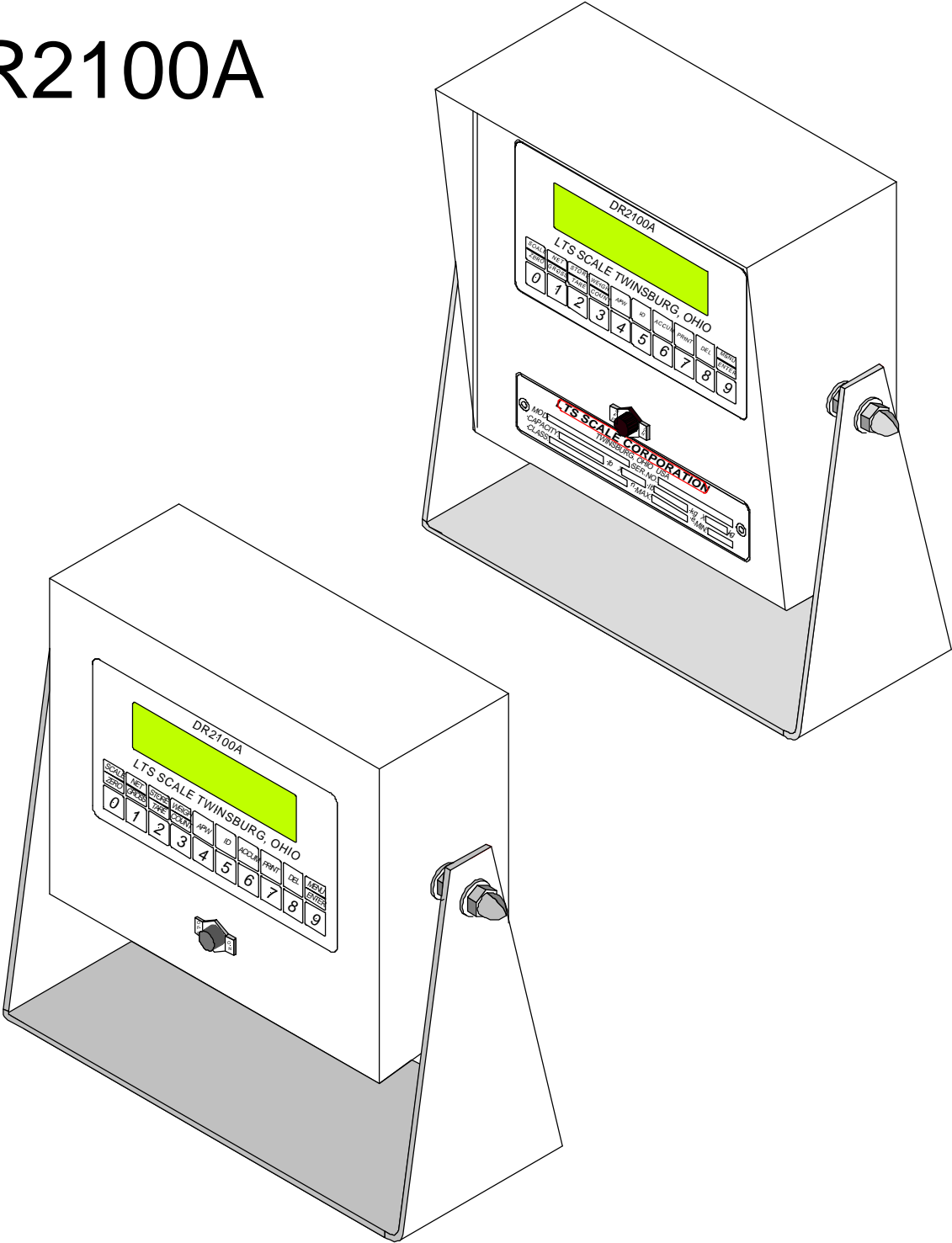
Make sure bottom suspension bolt does not bottom out against load cell center.

**CAUTION: Bottoming out suspension bolt can damage load cell.**

- 11.12. Tighten jam nut on bottom suspension bolt against bottom of load cell. Hold cell from turning.
- 11.13. Tighten jam nut on bottom suspension bolt against flat washer.
- 11.14. Tighten middle jam nut against bottom nut (if present).
- 11.15. Install load cell cover plate.
- 11.16. If signal wires were disconnected in previous step power down indicator and reconnect signal leads.
- 11.17. Install forks and fork stop bolts (bolts that keep forks from sliding off the end).
- 11.18. Exercise scale with a load equal to at least 25% of scale capacity.
- 11.19. Re-adjust alignment bolts per scale installation directions.
- 11.20. Re-calibrate.

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# DR2100A



# Technical Manual

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# General Information

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This section details the general information concerning the standard LTS SCALE DR2100A indicator. This indicator was specifically designed for industrial on-board weighing system applications. The rugged design of this unit will provide reliability and durability required in these environments.

## **1. Standard Features**

The versatile DR2100A digital indicator offers the following standard features:

- ◆ *Rugged Steel Enclosure*
- ◆ *Water and Dust Resistant*
- ◆ *1.0 Inch LCD Display*
- ◆ *2 Line Alphanumeric Display*
- ◆ *16 Characters/Line*
- ◆ *Back-lit Display*
- ◆ *Universal Mounting Bracket*
- ◆ *12 VDC to 50 VDC Operation*
- ◆ *Low Power Indication*
- ◆ *Zero Tracking*
- ◆ *Dummy Zero*
- ◆ *Motion Detection*
- ◆ *Push-button Zero*
- ◆ *Push-button Tare*
- ◆ *Push-button Weight Accumulation*
- ◆ *Push-button Print*
- ◆ *NET/GROSS Switching*
- ◆ *Keyboard ID Number Entry*
- ◆ *Pounds/Kilograms Switching*
- ◆ *Average Part Weight (APW) Entry*
- ◆ *Piece Count Capabilities*
- ◆ *Function Lockout Capabilities*
- ◆ *Custom Printout Setup Capabilities*
- ◆ *Keyboard Calibration*
- ◆ *Four-Point Linearity Calibration*
- ◆ *Single-Point Calibration*

## **2. Indicator Options**

The following options are available for the DR2100A indicator:

- ◆ *Custom Software*
- ◆ *Time & Date*
- ◆ *Remote Push-button Operation*
- ◆ *Multiple Setpoint Controls*
- ◆ *RS232C Output*
- ◆ *Barcode Scanning*
- ◆ *Radio Frequency Operation*
- ◆ *Ticket Printing*
- ◆ *Roll Tape Printing*
- ◆ *Barcode Printer*











## **3. Display Description**

The display has two display lines. Each line is capable of displaying 16 alphanumeric characters. The display is equipped with a backlight.

---

## 4. Keyboard Controls

This section examines the functions of the various keyboard operations that can be performed on the DR2100A indicator. There are 21 keys on the keyboard; 10 numeric key (0-9), 10 function keys plus Reset key (see figure 1-1).

Label	Keyboard Function
	Press to zero scale (with no load on the scale).
	Press to display Net or Gross weight (only displays net when a tare is entered).
	Key in the weight of the empty container. Press <b>STORE TARE</b> key. -OR- pick up empty container press <b>STORE TARE</b> key. To clear tare: press <b>0</b> key. Press <b>STORE TARE</b> key.
	Press to toggle between weigh and count modes.
	Used to enter the <b>Average Part Weight</b> for piece counting purposes. Press <b>APW</b> key. Key in the average part weight. Press <b>ENTER</b> Key. See WEIGH/COUNT key.
	To entering an ID number, key in an ID number. Press <b>ID</b> key. Recall the ID number, press and hold <b>ID</b> key. To clear the ID number, press <b>0</b> . Press <b>ID</b> key.
	Lift load, press <b>ACCUM</b> key. Weight and count are stored. Remove load. Lift second load, press <b>ACCUM</b> key. Weights and counts will be added to previous values. Press and hold <b>ACCUM</b> key to display accumulated weight. To clear, press <b>0</b> . Press <b>ACCUM</b> key.
	Press <b>PRINT</b> key to send data out the data port.
	Press <b>DEL</b> key to backspace one digit when entering a numeric value, also used to toggle between selections.
	Press <b>MENU</b> key for lb/kg switching. Press once, then press <b>DEL</b> key. Press <b>MENU</b> key twice to recall a stored tare weight. In program mode press <b>ENTER</b> to accept selections.
<b>R</b>	<b>R (RESET)</b> key is used to unlock the display. To reset the display hold down <b>DEL</b> key and push and release <b>R</b> key, then release the <b>DEL</b> key.

---

## **5. Operation Sequences**

- 5.1. Gross Weighing
- Raise empty forks off ground and level
  - Press **SCALE/ZERO** key
  - Press **STORE/TARE** key (clears previous tare value)
  - Lower forks and lift load
  - Gross weight displayed
- 5.2. Net Weighing - Push-button Tare
- Raise empty forks off ground and level
  - Press **SCALE/ZERO** key
  - Press **STORE/TARE** key (clears previous tare value)
  - Lower forks and lift load
  - Press **STORE/TARE** key
  - Add additional weight to lift
  - Net weight displayed
- 5.3. Net Weighing - Keyboard Tare
- Raise empty forks off ground and level
  - Press **SCALE/ZERO** key
  - Press **STORE/TARE** key (clears previous tare value)
  - Lower forks and lift load
  - Key in tare value
  - Press **STORE/TARE** key
  - Net weight displayed
- 5.4. Piece Counting
- Raise empty forks off ground and level
  - Press **SCALE/ZERO**
  - Press **STORE/TARE** key (clears previous tare value)
  - Lower forks and lift load
  - Press **APW** key
  - Key in APW value or accept displayed value
  - Press **APW** key
  - Press **WEIGHT/COUNT** key
  - Read count on top line and weight on bottom line
- 5.5. Gross Weight Accumulation
- Raise empty forks off ground and level
  - Press **SCALE/ZERO**
  - Press **STORE/TARE** key (clears previous tare value)
  - Lower forks and lift load
  - Read weight
  - Press **ACCUM** key (weight value added)
  - Repeat for additional loads
    - To view: Press and hold **ACCUM** key
    - To Clear: Press **0** key
  - Press **ACCUM** key

- 
- 5.6. Net Weight Accumulation
- Raise empty forks off ground and level
  - Press **SCALE/ZERO**
  - Press **STORE/TARE** key (clears previous tare value)
  - Key in tare value
  - Press **STORE/TARE** key
  - Lower forks and lift load
  - Read weight
  - Press **ACCUM** key (weight value added)
  - Repeat for additional loads
    - To view: Press and hold **ACCUM** key
    - To Clear: Press **0** key  
Press **ACCUM** key
- 5.7. Counting Accumulation
- Raise empty forks off ground and level
  - Press **SCALE/ZERO**
  - Press **STORE/TARE** key (clears previous tare value)
  - Press **APW** key
  - Key in APW value or accept displayed value
  - Press **APW** key
  - Press **WEIGHT/COUNT** key
  - Key in tare value
  - Press **STORE/TARE** key
  - Lower forks and lift load
  - Read weight
  - Press **ACCUM** key (count value added)
  - Repeat for additional loads
    - To view: View displays weight total only  
Total data can be sent to printer
    - To Clear: Press **0** key. Press **ACCUM** key
- 5.8. Printing
- Press **PRINT** key at any time to send data to printer.  
Program setup determines what will be printed.  
See Technical manual for programming data output.  
Note: Unit must have optional RS232 option installed.

## 6. DR2100A Keyboard Layout

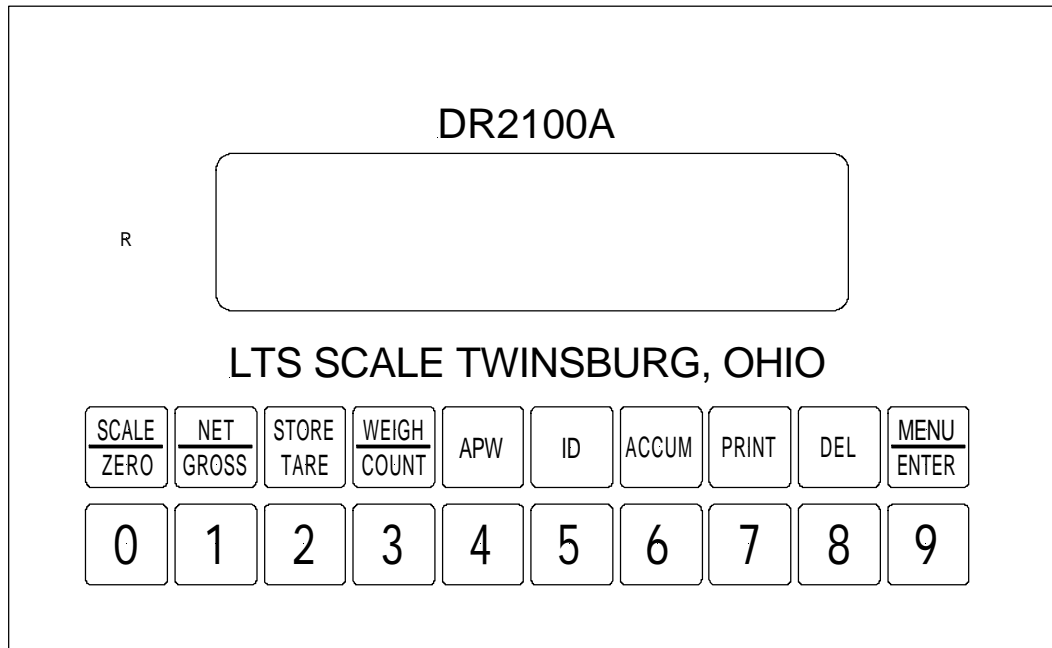


Figure 1

## 7. Main PC Board Layout

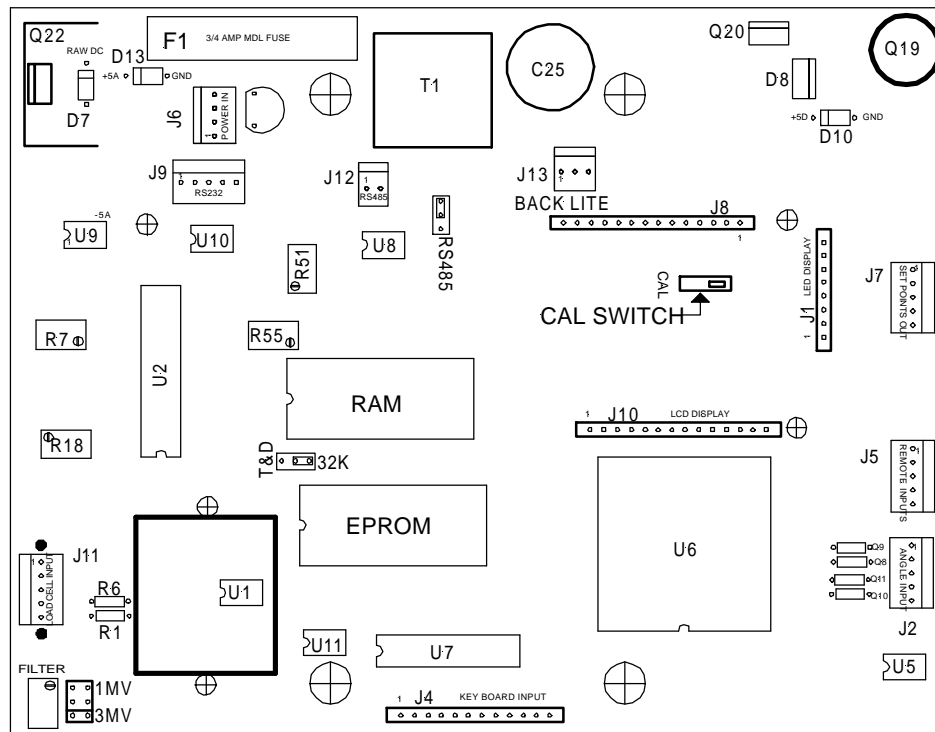


Figure 2

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## **8. Connector Pin Outs - Main Board**

<b>J1 Pin</b>	<b>LED Display</b>
1	+5VDC
2	+5VDC
3	PG0
4	PG1
5	PG2
6	PG3
7	GND
8	GND

<b>J5 Pin</b>	<b>Remote Inputs</b>
1	REMOTE 1
2	GND
3	REMOTE 2
4	GND
5	PG3

<b>J7 Pin</b>	<b>SETPOINTS</b>
1	GND
2	SP1
3	SP2
4	SP3
5	RAW DC

**Connector J8 & J10 - N/A:**

<b>J11 Pin</b>	<b>LOAD CELL</b>
1	+EX
2	+SIG
3	-SIG
4	-EX
5	SHLD

<b>J4 Pin</b>	<b>Keyboard</b>
1	GND
2	RESET
3	Y1
4	Y2
5	Y3
6	Y4
7	Y5
8	X1
9	X4
10	X2
11	X3
12	No Conn.

<b>J6 Pin</b>	<b>Power</b>
1	+DC IN, 11 TO 50 VDC
2	GND
3	GND
4	+DC IN, 11 TO 50 VDC

<b>J9 Pin</b>	<b>RS232</b>
1	PA6 (TTL INPUT)
2	RS232 OUT
3	GND
4	RS232 IN
5	+5VDC

<b>J12 Pin</b>	<b>RS485</b>
1	485+
2	485-

## 9. Operating Voltage - Filter Board

- 9.1. Remove cover from back of indicator.

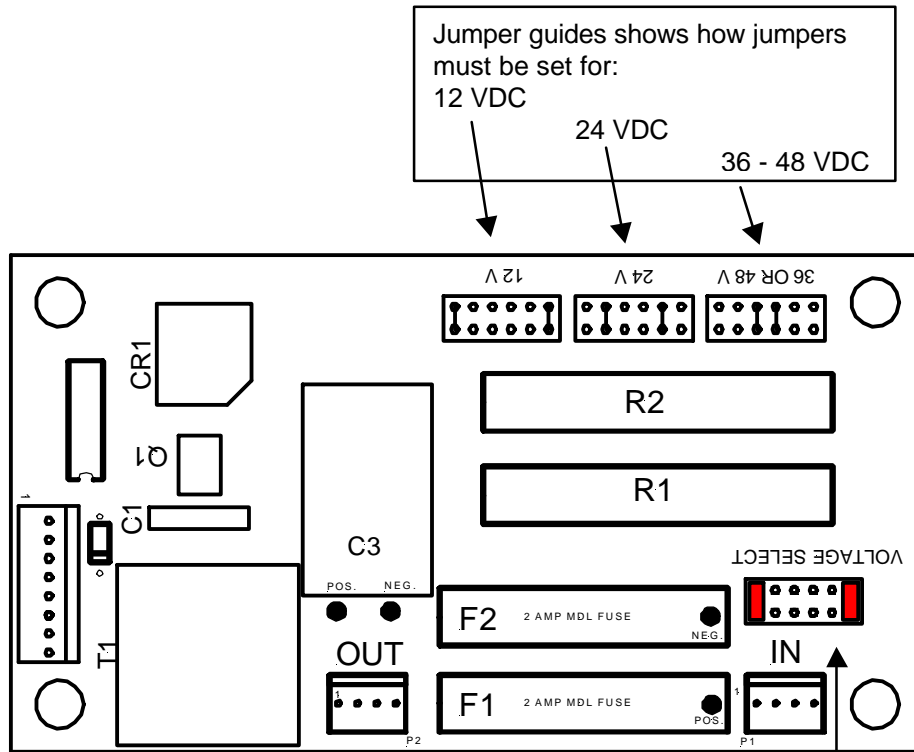


Figure 5. Voltage Selection

- 9.2. Determine input voltage indicator will be operating on.  
Example: Most propane powered lift trucks operate on 12 VDC.  
While electric powered lift trucks operate on 12, 24, 36 or 48 VDC.

If you need assistance determining what the operating voltage is and how the jumpers are to be set, please contact LTS SCALE CORPORATION Technical department with any questions.

- 9.3. Use jumper guide printed on to edge of Filter Board to determine jumper positions.  
9.4. Move voltage selection jumpers to match the specific voltage of the truck.

---

## **10. Load Cell Cable Pin Outs – Standard Units (Non-NTEP)**

<b>LC Cable– Black Coiled Cord</b>		
Pin	Color	Description
A	Red	+ Excitation
B	Green	+ Signal
C	White	- Signal
D	Black	- Excitation
E	Shield	Shield

<b>Electro Coil Cable – Gray Cable</b>		
Pin	Color	Description
A	Black 1	+ Excitation
B	Black 2	+ Signal
C	Black 3	- Signal
D	Yellow	- Excitation
E	Shield	Shield

## **11. Load Cell Cable Pin Outs – NTEP (Legal-for-Trade)**

<b>NTEP LC Cable– Black Coiled Cord</b>		
Pin	Color	Description
1	Red	+ Excitation
2	Green	+ Signal
3	White	- Signal
4	Shield	Shield
5	Brown	X Axis
6	Black	- Excitation
7	Blue	Y Axis

<b>NTEP Electro Coil Cable –Gray Cable</b>		
Pin	Color	Description
1	Yellow	+ Excitation
2	Green	+ Signal
3	White	- Signal
4	Shield	Shield
5	Brown	X Axis
6	Pink	- Excitation
7	Blue	Y Axis

## 12. Set-Up Code Screens 1 Standard

CAL SWITCH ON KEYBOARD 2100	CAL SWITCH ON KEYBOARD 2104	CAL SWITCH ON KEYBOARD 9080	CAL SWITCH ON KEYBOARD 9081	CAL SWITCH ON KEYBOARD 9082
LOCK KEYBOARD? YES = LOCK OUT	SLIDE CALIBRATE SWITCH OFF	SELECT COUNTRY NUMBER = 2	DEL FACTORY CAL? YES *NO	CHECK WEIGH MODE *YES NO
KEYBOARD TARE YES *NO	EXPAN= 0.0 GROSS= 0 LB	SELECT DECIMAL NUMBER= 0	ARE YOU SURE ? YES *NO	
I.D. YES *NO		SELECT FIXED ZRO NUMBER= 0	CAL STEP # 1 WEIGHT = XXXX	
SCALE ZERO YES *NO		SELECT INCREMENT NUMBER = 2500	CAL STEP # 2 NUMBER= XXXX	
PUSH BUTTON TARE YES *NO		USE ENTER OR DEL NUMBER= 5002	CAL STEP # 3 WEIGHT = XXXX	
PRINT YES *NO		LEGAL FOR TRADE YES *NO	CAL STEP # 4 NUMBER= XXXX	
ACCUM YES *NO		SELECT MOTION #D NUMBER = 1		
MENU YES *NO		SELECT MOT DELAY SECONDS= 1.0		
SETUP YES *NO		DISPLAY MOTION ? YES *NO		
CALIBRATE YES *NO		SELECT TRACK #D NUMBER = 1		
CONFIG SETPOINTS YES *NO				
CONFIG REMOTE IN YES *NO				
CONFIG PRINT YES *NO				
SET TIME & DATE YES *NO				
RAW A/D KB TEST YES *NO				
SETPOINT ENTRY YES *NO				
PIECE COUNT YES *NO				
PROGRAM NAME YES *NO				
*****				

## Set-Up Code Screens 2

## Standard

CAL SWITCH ON  
KEYBOARD 9083

REMOTE INPUT 1  
PRINT

REMOTE INPUT 2  
ACCUM

CAL SWITCH ON  
KEYBOARD 9084

SELECT BAUD  
9600

CONTINUOUS OUTPUT  
YES \*NO

# TOP LINE FEEDS  
NUMBER = 2

PRINT ITEM # 1  
TIME & DATE

# SPACES OVER  
NUMBER = 1

# CR LF  
NUMBER = 1

PRINT ITEM # 2  
I.D.

# SPACES OVER  
NUMBER = 1

# CR LF  
NUMBER = 1

PRINT ITEM # 3  
GROSS

# SPACES OVER  
NUMBER = 1

# CR LF  
NUMBER = 1

PRINT ITEM # 4  
TARE

# SPACES OVER  
NUMBER = 1

# CR LF  
NUMBER = 1

PRINT ITEM # 5  
NET

# SPACES OVER  
NUMBER = 1

# CR LF  
NUMBER = 1

PRINT ITEM # 6  
ACCUM

# SPACES OVER  
NUMBER = 1

# CR LF  
NUMBER = 1

PRINT ITEM # 7  
PIECE COUNT

# SPACES OVER  
NUMBER = 1

# CR LF  
NUMBER = 1

CAL SWITCH ON  
KEYBOARD 9085

SET TIME & DATE  
YEAR = XX

SET TIME & DATE  
MONTH = XX

SET TIME & DATE  
DAY = XX

SET TIME & DATE  
HOURS = XX

SET TIME & DATE  
MINUTES = XX

CAL SWITCH ON  
KEYBOARD 9086

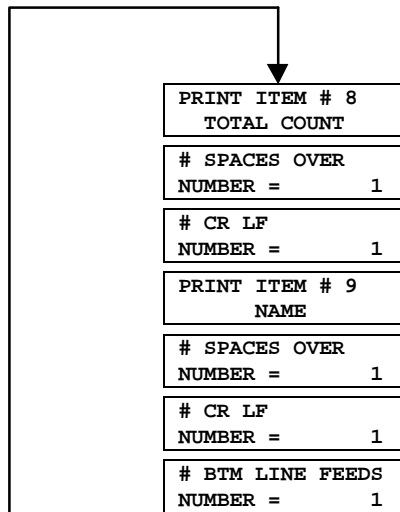
KB KEY = 19  
RAW A/D= XXXXXXXX

CAL SWITCH ON  
KEYBOARD 9087

SETPOINT # 1  
WEIGHT = XXXXX

SETPOINT # 2  
WEIGHT = XXXXX

SETPOINT # 3  
WEIGHT = XXXXX



Set-Up Code Screens 3

Standard

CAL SWITCH ON  
KEYBOARD 9088

CAL SWITCH ON  
KEYBOARD 9089

CAL SWITCH ON  
KEYBOARD 9090

CAL SWITCH ON  
KEYBOARD 9091

CAL SWITCH ON  
KEYBOARD 9092

AVERAGE PIECE WT  
LB = 0.00

PROGRAMMING THRU  
SERIAL PORT

SINGLE POINT CAL  
YES \*NO

FILTER BAND  
WEIGHT = 2

LINEARITY STEP 1  
OFFSET = 0

ARE YOU SURE ?  
YES \*NO

LINEARITY STEP 1  
ADD-WT = 0

SET SCALE ZERO ?  
YES \*NO

LINEARITY STEP 1  
FACTOR = 400000

CAL MODE  
WEIGHT = 0

LINEARITY STEP 2  
OFFSET = 0

CAL MODE  
WEIGHT = 1000

LINEARITY STEP 2  
ADD-WT = 0

LINEARITY STEP 2  
FACTOR = 400000

LINEARITY STEP 3  
OFFSET = 0

LINEARITY STEP 3  
ADD-WT = 0

LINEARITY STEP 3  
FACTOR = 400000

LINEARITY STEP 4  
OFFSET = 0

LINEARITY STEP 4  
ADD-WT = 0

LINEARITY STEP 4  
FACTOR = 400000

SINGLE POINT CAL  
FACTOR = 100000

NOMINAL ZERO  
NUMBER= 0

SCALE ZERO  
NUMBER= 0

# 13. Set-Up Code Screens 1 NTEP

CAL SWITCH ON KEYBOARD 2100	CAL SWITCH ON KEYBOARD 2104	CAL SWITCH ON KEYBOARD 9080	CAL SWITCH ON KEYBOARD 9081	CAL SWITCH ON KEYBOARD 9083
LOCK KEYBOARD? YES = LOCK OUT	SLIDE CALIBRATE SWITCH OFF	KGS ONLY YES *NO	DEL FACTORY CAL? YES *NO	REMOTE INPUT 1 PRINT
KEYBOARD TARE YES *NO	ZERO TRACK *YES NO	SELECT COUNTRY NUMBER = 5	ARE YOU SURE ? YES *NO	REMOTE INPUT 2 ACCUM
I.D. YES *NO	EXPAN= 0.0 GROSS= 0 LB	SELECT DECIMAL NUMBER= 0	CAL STEP # 1 WEIGHT = XXXX	
SCALE ZERO YES *NO		SELECT FIXED ZRO YES *NO	CAL STEP # 2 NUMBER= XXXX	
PUSH BUTTON TARE YES *NO		INCREMENTS NUMBER = 1000	CAL STEP # 3 WEIGHT = XXXX	
PRINT YES *NO		USE ENTER OR DEL NUMBER= 5005	CAL STEP # 4 NUMBER= XXXX	
ACCUM YES *NO		LEGAL FOR TRADE *YES NO		
MENU YES *NO		SELECT MOTION #D NUMBER = 1		
SETUP YES *NO		SELECT MOT DELAY SECONDS= 0.5		
CALIBRATE YES *NO		DISPLAY MOTION ? *YES NO		
CONFIG SETPOINTS YES *NO		SELECT TRACK #D NUMBER = 1		
CONFIG REMOTE IN YES *NO				
CONFIG PRINT YES *NO				
SET TIME & DATE YES *NO				
RAW A/D KB TEST YES *NO				
SETPOINT ENTRY YES *NO				
PIECE COUNT YES *NO				
PROGRAM NAME YES *NO				
*****				

## Set-Up Code Screens 2

## NTEP

CAL SWITCH ON  
KEYBOARD 9084

SELECT BAUD  
9600

CONTINUOUS OUTPUT  
YES \*NO

# TOP LINE FEEDS  
NUMBER = 2

PRINT ITEM # 1  
TIME & DATE

# SPACES OVER  
NUMBER = 1

# CR LF  
NUMBER = 1

PRINT ITEM # 2  
I.D.

# SPACES OVER  
NUMBER = 1

# CR LF  
NUMBER = 1

PRINT ITEM # 3  
GROSS

# SPACES OVER  
NUMBER = 1

# CR LF  
NUMBER = 1

PRINT ITEM # 4  
TARE

# SPACES OVER  
NUMBER = 1

# CR LF  
NUMBER = 1

PRINT ITEM # 5  
NET

# SPACES OVER  
NUMBER = 1

# CR LF  
NUMBER = 1

PRINT ITEM # 6  
ACCUM

# SPACES OVER  
NUMBER = 1

# CR LF  
NUMBER = 1

PRINT ITEM # 7  
PIECE COUNT

# SPACES OVER  
NUMBER = 1

# CR LF  
NUMBER = 1

CAL SWITCH ON  
KEYBOARD 9085

SET TIME & DATE  
YEAR = XX

SET TIME & DATE  
MONTH = XX

SET TIME & DATE  
DAY = XX

SET TIME & DATE  
HOURS = XX

SET TIME & DATE  
MINUTES= XX

CAL SWITCH ON  
KEYBOARD 9086

CAL SWITCH ON  
KEYBOARD 9087

SETPOINT # 1  
WEIGHT = XXXXX

SETPOINT # 2  
WEIGHT = XXXXX

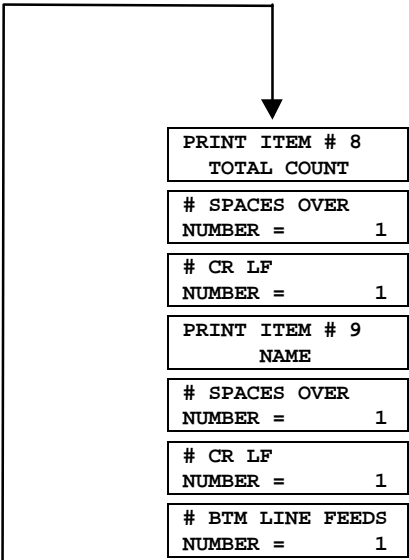
SETPOINT # 3  
WEIGHT = XXXXX

CAL SWITCH ON  
KEYBOARD 9088

AVERAGE PIECE WT  
LB = 0.00

CAL SWITCH ON  
KEYBOARD 9089

PROGRAMMING THRU  
SERIAL PORT



## Set-Up Code Screens 3

## NTEP

CAL SWITCH ON KEYBOARD 9090	CAL SWITCH ON KEYBOARD 9091	CAL SWITCH ON KEYBOARD 9092	CAL SWITCH ON KEYBOARD 9093	CAL SWITCH ON KEYBOARD 9094
SINGLE POINT CAL YES *NO	LINEARITY STEP 1 OFFSET = 0	GROSS= 0 FB=-0.0 LR=-LR	ZONE 1 FACTOR NUMBER=1.0000000	CALIB ANGLE FTRS YES *NO
ARE YOU SURE ? YES *NO	LINEARITY STEP 1 ADD-WT = 0	SET ANGLE ZERO YES *NO	ZONE 2 FACTOR NUMBER=1.0000000	CALIB ANGLE FTRS *YES NO
SET SCALE ZERO ? YES *NO	LINEARITY STEP 1 FACTOR = 400000	FB ANGLE ZERO NUMBER= 128	ZONE 3 FACTOR NUMBER=1.0000000	TEST LOAD VALUE WEIGHT = 1000
CAL MODE WEIGHT = 0	LINEARITY STEP 2 OFFSET = 0	LR ANGLE ZERO NUMBER= 128	ZONE 4 FACTOR NUMBER=1.0000000	CAL SWITCH ON
CAL MODE WEIGHT = 1000	LINEARITY STEP 2 ADD-WT = 0	FB ANGLE SPAN FACTOR= 42667	ZONE 5 FACTOR NUMBER=1.0000000	TURN CAL SWITCH OFF TO CONTINUE
	LINEARITY STEP 2 FACTOR = 400000	LR ANGLE SPAN FACTOR= 42667	ZONE 6 FACTOR NUMBER=1.0000000	REAR UP 1000 FB=-0.0 LR=0.0
	LINEARITY STEP 3 OFFSET = 0	FRONT TO FRONT YES *NO	ZONE 7 FACTOR NUMBER=1.0000000	RIGHT UP 1000 FB=-0.0 LR=0.0
	LINEARITY STEP 3 ADD-WT = 0		ZONE 8 FACTOR NUMBER=1.0000000	FRONT UP 1000 FB=-0.0 LR=0.0
	LINEARITY STEP 3 FACTOR = 400000		ZONE 1 ANGLE SP NUMBER= 3.50	LEFT UP 1000 FB=-0.0 LR=0.0
	LINEARITY STEP 4 OFFSET = 0		ZONE 2 ANGLE SP NUMBER= 3.50	LTS SCALE GROSS= 1000 LB
	LINEARITY STEP 4 ADD-WT = 0		ZONE 3 ANGLE SP NUMBER= 3.50	
	LINEARITY STEP 4 FACTOR = 400000		ZONE 4 ANGLE SP NUMBER= 3.50	
	SINGLE POINT CAL FACTOR = 100000		ZONE 5 ANGLE SP NUMBER= 3.50	
	NOMINAL ZERO NUMBER= 0		ZONE 6 ANGLE SP NUMBER= 3.50	
	SCALE ZERO NUMBER= 0		ZONE 7 ANGLE SP NUMBER= 3.50	
			ZONE 8 ANGLE SP NUMBER= 3.50	

---

# INDICATOR SETUP

---

This section provides setup and calibration instructions for the DR2100A indicator. The indicator setup and calibration is accomplished by entering various configuration codes through the keyboard.

## ***14. Configuration Codes***

Note: the indicator must be placed in the program mode prior to entering a configuration code. See the following list of configuration codes that may be accessed. To enter the program mode, slide **CAL** switch to the left into the **CAL** position. This switch is located on the main board and can be accessed by removing the rear cover of the indicator. The display will indicate [ **CAL SWITCH ON** ], verifying that the indicator is in the program mode. Slide **CAL** switch to right to exit program mode and return to normal operation.

<b>Code Listing</b>	<b>Function      Standard</b>	<b>Function      NTEP</b>
2100	Keyboard Lockout	Keyboard Lockout
2104	Expanded Test Mode ( X10 )	Expanded Test Mode ( X10 )
2105	Restore Name On Top Line	Restore Name On Top Line
2169	Load Defaults	Load Defaults
6969	Initialize Clock Chip	Initialize Clock Chip
9080	Setup	Setup
9081	Four-Point Calibration	Four-Point Calibration
9082	Configure Setpoint Mode	
9083	Configure Remote Inputs	Configure Remote Inputs
9084	Configure Print	Configure Print
9085	Set Time & Date	Set Time & Date
9086	Keyboard Test, View A/D Counts	Keyboard Test, View A/D Counts
9087	Setpoint Recall/Store	Setpoint Recall/Store
9088	APW Recall/Store	APW Recall/Store
9089	Program Name Through Serial Port	Program Name Through Serial Port
9090	Single-Point Calibration	Single-Point Calibration
9091	Digital Filter	View / Store Calibration Factors
9092	View / Store Calibration Factors	View / Set Angle Zero and Span
9093		View / Set Angle Factors
9094		Out-of-Level Calibration
9095		Print Calibration Factors

Note: if display shows "LOCKED OUT" use configuration Code 2100 to unlock specific function or key to enable viewing or changing.

## 15. Code 2100 - Keyboard Lockout

**Note:** Keyboard functions and the 90xx codes may be individually locked out. Slide **CAL** switch to the left into the **CAL** position. Press keys **2100**. Press **ENTER** key.

LOCK KEYBOARD? YES = LOCKOUT
---------------------------------

Top display line shows the item to be enabled or disabled. Bottom display line shows the current status indicated by the asterisk.

Disabled or lockout = YES  
Enabled or accessible = NO

KEYBOARD TARE *YES NO
--------------------------

To lock or unlock a function:

Use **DEL** key to toggle selection between **YES** and **NO**. Press **ENTER** to accept selection and proceed to the next function.

### Available Lockout Functions

Scale Zero	Code 9080; Setup
Push Button Tare	Code 9081; Calibration
Keyboard Tare	Code 9082; Configure Setpoints
I.D.	Code 9083; Configure Remote Inputs
Accumulate	Code 9084; Configure Print
Print	Code 9085; Set Time & Date – Option
Menu ( lb./kg, Recall Tare )	Code 9087; Setpoint Entry
	Code 9088; Piece Count/ APW
	Code 9089; Program Name

**Note:** in the event that the indicator locks up or does not respond properly, hold down **DEL** key and press and release **R** key then release the **DEL** key to reset the indicator.

## 16. Code 2104 - Expand Test Mode X10

Expand mode is used for testing with a finer graduation size than normally displayed. Example: if the Graduation size is set for 5 lb. then expanded mode will display 0.5 lb. graduations. To enter expand mode: Slide **CAL** switch to the left into the **CAL** position. Press keys **2104**. Press **ENTER**. Slide **CAL** switch to right to exit program mode.

CAL SWITCH ON
---------------

ZERO TRACK

**NTEP** program only. Version PR190 or newer. Disables Zero Tracking in test mode. Re-enabled upon expand mode exit. Press **DEL** key to select mode. Press **ENTER** key to accept the selected setting.

ZERO TRACK *YES NO
-----------------------

Top display line shows the expanded weight. Bottom display line shows the normal weight. To exit and return to normal operation, simply press **ENTER** key.

EXPAN=	0.0
GROSS=	0 LB

## 17. Code 2105 - Restore Default Name

Restore the default name [ **LTS SCALE** ] to the top display line. Press numeric keys **2105**. Press **ENTER** key. The top display line will display the default name in the Gross weigh mode.

!@#%^&*%\$#@!#	
GROSS=	0 LB

LTS SCALE	
GROSS=	0 LB

---

## **18. Code 2169- Load Default Settings**

**CAUTION! This code completely wipes out calibration and other setup settings. Consult factory prior to entering the load default settings mode.**

The load default setting code is used to initialize the main board.

Default values loaded may not be the settings required for your application.

Slide **CAL** switch to the left into **CAL** position.

Press numeric keys **2169**. Press **ENTER** key.

The indicator display will briefly flash when loading is complete.

Configure indicator to required specifications. Four-Point Calibration must be done before the Single-Point calibration can be preformed.

## **19. Code 6969 - Initialize Clock Chip**

Initializes the clock on units equipped with the Time & Date option.

See Setup – Code 9085 to set time and date.

To initialize the clock:

Press keys **6969**. Press **ENTER** key.

Units ordered with the Time & Date option are initialized before being shipped.

## **20. Code 9080 - Indicator Setup**

**Note:** indicator setup has been performed at the factory. This section is provided in the event that these settings need to be changed.

Slide **CAL** switch to the left into **CAL** position.

Press keys **9080**. Press **ENTER** key.

CAL SWITCH ON
---------------

KGS ONLY

**NTEP program only. Version PR190 or newer.**

Calibrate and weigh in Kilograms only select YES.

Press **DEL** key to select mode.

Press **ENTER** key to accept the selected setting.

If changing mode (LB/KG to KGS ONLY) or (KGS ONLY to LB/KG) the indicator **MUST** be reconfigured and Four-Point calibration MUST be done.

KGS ONLY
YES *NO

COUNTRY

Available counts by values are **1 2 5**

Press **DEL** key to select count-by value.

Press **ENTER** key to accept the selected setting.

SELECT COUNTRY
NUMBER = 2

DECIMAL POSITION

Available decimal positions are **0 1 2 3**

Press **DEL** key to select the decimal position.

Press **ENTER** key to accept setting.

SELECT DECIMAL
NUMBER = 0

FIXED ZEROS

Available fixed zeros are \* **0 1 2**

Press **DEL** key to select the number of fixed zeroes.

Press **ENTER** key to accept setting.

**Note:** if there are decimals selected, the fixed zeros are not available.

SELECT FIXED ZRO
NUMBER = 0

---

## INCREMENTS

Display shows:

Number of increments available:

500 600 1000 1200 1500 2000  
2500 3000 4000 5000 6000 10000

Press **DEL** key to select the correct value.

Press **ENTER** key to accept setting.

Displays shows capacity, plus the count-by factor.

Example:

Count by factor: = 2

Decimal positioning value: = 0

Increments: = 2500

2500 (increments) x 2 (count-by) = 5000

Display shows: 5002

SELECT INCREMENT NUMBER = 2500
-----------------------------------

USE ENTER OR DEL 5002
--------------------------

If the capacity and count-by factor are correct then, press **ENTER** key to accept these settings. If not press **DEL**, and return to the beginning.

## LEGAL FOR TRADE

Press **DEL** key to select **YES** or **NO**.

Press **ENTER** key to accept setting.

LEGAL FOR TRADE YES *NO
----------------------------

## SELECT MOTION

Available motion settings are:

Legal-for-Trade = **YES**: 1 2 3

Legal-for-Trade = **NO**: 1 2 3 4 5 6 7 8 9

Press **DEL** key to select motion setting.

Press **ENTER** key to accept setting.

SELECT MOTION #D NUMBER = 1
--------------------------------

## MOTION DELAY

Available motion delay settings are:

**0.5 1.0 1.5 2.0 2.5 3.0**

Press **DEL** key to select the motion delay setting.

Press **ENTER** key to accept setting.

**Note:** an analog filter is available on the main board. Potentiometer (R19) is located at the bottom left-hand corner of the main board. Adjusting this potentiometer may require re-calibration after adjustment. Counterclockwise will slow the update rate while clockwise will speed the rate up.

SELECT MOT DELAY SECONDS = 1.0
-----------------------------------

## DISPLAY MOTION

**YES** Weight is displayed during motion conditions.

**NO** Weight is only displayed when within the motion band.

Press **DEL** key to select **YES** or **NO**.

Press **ENTER** key to accept setting.

DISPLAY MOTION *YES NO
---------------------------

## ZERO TRACK DIGITS

Numbers of graduations for zero tracking are:

**.6 1 3**

**End of Indicator Setup - Code 9080.**

Enter another configuration code to review or change parameters or slide **CAL** switch to right to exit program mode.

SELECT TRACK #D NUMBER = 1
-------------------------------

CAL SWITCH ON
---------------

---

## **21. Code 9081 – Four-Point Calibration**

A Four-Point linearity calibration is generally not required after initial installation. Single-Point calibration should be used. The Four-Point calibration may be required in the event of load cell replacement or weight loads of increasing value are not linear.

## **22. Code 9082 - Configure Setpoint Mode**

Press keys **9082**. Press **ENTER** key.

### **CHECK WEIGH MODE**

**YES** = 2 Setpoint value mode

**NO** = 3 Setpoint value mode

Press **DEL** key to select **YES** or **NO**.

Press **ENTER** to accept setting.

**See:** Code 9087 for entering Setpoint values.

CHECK WEIGH MODE
*YES NO

## **23. Code 9083 - Configure Remote Inputs**

Press keys **9083**. Press **ENTER** key.

### REMOTE INPUT 1

Functions available for Remote Input #1 are:

**PRINT**            **ACCUMULATE**        **INHIBIT**

**SCALE ZERO**    **PUSH-BUTTON**        **TARE**

Press **DEL** key to select function for Remote Input #1.

Press **ENTER** key to accept setting.

REMOTE INPUT 1
PRINT

### REMOTE INPUT 2

Functions available for Remote Input #2 are:

**PRINT**            **ACCUMULATE**        **INHIBIT**

**SCALE ZERO**    **PUSH-BUTTON**        **TARE**

Press **DEL** key to select function for Remote Input #2.

Press **ENTER** key to accept setting.

REMOTE INPUT 2
ACCUM

## **24. Code 9084 - Configure Print**

**Note:** the RS232 data format is 8 data bits, 1 stop bit and No parity.

**Data, Stop and Parity are not selectable.**

Press keys **9084**. Press **ENTER** key.

### SELECT BAUD

Available baud rates are: **1200 2400 4800 9600**

Press **DEL** key to select baud rate.

Press **ENTER** to accept setting.

SELECT BAUD
9600

### CONTINUOUS OUTPUT

Select **NO** for demand print to a printer.

Select **YES** for continuous data output.

Press **DEL** key to select **YES** or **NO**.

Press **ENTER** key to accept setting.

CONTINUOUS OUTPUT
YES *NO

---

## # TOP LINE FEEDS

Set to print blank lines (feed paper down) prior to printing selected data fields.  
Use the numeric keypad to enter the value of top line feeds.  
Press **ENTER** key to accept setting.

# TOP LINE FEEDS NUMBER = 2
--------------------------------

## PRINT ITEM # 1

Available items to be printed are:

Gross weight	ID (Identification Number)	Piece count
Tare weight	Accumulate	Total count
Net weight	Name	No print
	Time & Date (option)	

Press **DEL** key to select item.  
Press **ENTER** key to accept setting.

## # SPACES OVER

Sets the starting point on the left-hand margin for the selected print field.  
Key in the value for the starting point for Print Item 1.  
Press **ENTER** key to accept setting.

# SPACES OVER NUMBER = 1
-----------------------------

## # CR LF

Sets the vertical spacing between lines of data.  
**0** = next line of data will be printed on the same line  
**1** = data will be printed on the next line  
**2** = double spacing, one blank line between print field  
More line feeds results in a bigger vertical space between data lines.  
Use the numeric keypad to enter the value.  
Press **ENTER** key to accept setting.

# CR LF NUMBER = 1
-----------------------

**PRINT ITEM #1** to **PRINT ITEM #9** must be configured to print any of the ten print items in any order desired. Repeat **Print Item**, **# spaces** and **# CR LF** for all nine Print Items before next prompt is displayed.

## # BTM LINE FEEDS

Set to print blank lines (feed paper down) after printing selected data fields.  
Use the numeric keypad to enter the required value.  
Press **ENTER** key to accept setting.

# BTM LINE FEEDS NUMBER = 1
--------------------------------

## 25. Code 9085 - Setting Time & Date (Optional)

**Note:** this indicator utilizes the 24-hour clock (military time).

Press keys **9085**. Press **ENTER** key.

### YEAR

1 or 2 digit year entry.  
Use the numeric keypad to enter the Year.  
Press **ENTER** to accept setting.  
Note: enter up to a 2 digit year. If value entered is 98 or 99 the year will be printed as 19XX otherwise 20XX will be printed.

SET TIME & DATE YEAR = 1
-----------------------------

### MONTH

Use the numeric keypad to enter the Month.  
Press **ENTER** to accept setting.

SET TIME & DATE MONTH = 1
------------------------------

DAY

Use the numeric keypad to enter the Day.  
Press **ENTER** to accept setting.

SET TIME & DATE
DAY = 1

HOURS

Use the numeric keypad to enter the Hour.  
Press **ENTER** to accept setting.

SET TIME & DATE
HOUR = 1

MINUTES

Use the numeric keypad to enter the Minutes.  
Press **ENTER** to accept setting.

SET TIME & DATE
MINUTES = 1

## **26. Code 9086 - Reset Scale Zero or Keyboard Test & Raw A/D Test**

*Standard Program PR051F or earlier.*

Sets Scale Zero to A/D zero. Should be performed only if instructed by the factory.  
Scale should be re-calibrated before placed into service.

*Standard Program PR051G or later. NTEP Program PR170*

Troubleshooting tool used to view the raw A/D counts and test keyboard.

Press keys **9086**. Press **ENTER**.

Press **ENTER** to exit.

KB KEY = 19
RAW A/D= XXXXXXX

Top display line key pressed.

Keys 0 to 9 will indicate 0 to 9. Top row keys start at left, SCALE ZERO = 10 far right MENU/ENTER key = 19. MENU/ENTER key exits.

Display lower line shows raw A/D counts. Reading should be positive.

Maximum is 400,000 counts

## **27. Code 9087 – Entry of Setpoint Values**

Press keys **9087**. Press **ENTER** key.

SETPOINT # 1

Use numeric keypad to enter the weight value for Setpoint #1.  
Press **ENTER** key to accept value.

SETPOINT # 1
WEIGHT = XXXXXX

SETPOINT # 2

Use numeric keypad to enter the weight value for Setpoint #2.  
Press **ENTER** key to accept value.

SETPOINT # 2
WEIGHT = XXXXXX

SETPOINT # 3

**Only Displayed if Check Weigh Mode is set to No.** See Code 9082.

Use numeric keypad to enter the weight value for Setpoint #3.

Press **ENTER** key to accept value.

SETPOINT # 3
WEIGHT = XXXXXX

---

## **28. Code 9088 - Entry Of Average Part Weight**

Note: Same as using the **APW** key on the keyboard.

Press keys **9088**. Press **ENTER**.

Use the numeric keys to enter an **Average Part Weight (APW)**.

Press **ENTER** key to accept the displayed value.

AVERAGE PIECE WT
LB. = X.XX

## **29. Code 9089 - Program Name Through Serial Port**

Allows a 16 character alpha numeric string to be entered for a custom name.

This name is displayed on the top line of the display when in the Gross weigh mode. This header can also be selected to be printed, see Code 9084.

You need the RS232 option installed, data cable, and a PC running a terminal emulation program. Configure PC COMM port to match baud rate selected in Code 9084 (default 9600 baud), 8 data bits, NO parity, 1 stop bit.

Press keys **9089**. Press **ENTER**.

Display on PC will show:

```
[ LTS SCALE ...CHANGE NAME ? Y/N]
```

PROGRAMMING THRU
SERIAL PORT

To change: Send capitol "Y" from the PC to DR2100A.

Indicator sends:

```
[ENTER ALL 16 CHARACTERS ]  
[----- ]
```

Send all 16 characters. Fill to end with spaces if needed.

```
[YOUR NAME HERE ...CHANGE NAME ? Y/N]
```

If name is correct, then press any key to end, if not return to step I).

**NOTE:** To exit this mode from the keyboard:

- Press and hold **DEL** key.
- Press and release **R** (RESET) key.
- Release **DEL** key.

## **30. Code 9090 – Single-Point Calibration**

Single-Point Calibration can only be done after the Four-Point calibration has been completed at least one time. If the display shows **ERROR** when this code is entered then the Four-Point calibration must be completed first.

See Calibration section.

---

### **31. Code 9091 - Filter Band 9091**

#### **View / Store Calibration Factors**

Standard Program PR051G or later.

##### **Filter Band**

Filter band is the window size (in number of graduations) the Digital Filter is to work. To determine what setting to use: Set value to (1) one. Exit CAL mode and operate truck normally. Observe weight readings as weight is applied. If the weight value displayed bounces above and below the value of the test load note the amount. Divide the value by the graduation size and round the value up. Enter calculated value in and re-test. DO NOT ENTER EXCESSIVE VALUES.

All **NTEP** Program versions.

##### **View / Store Calibration Factors**

*This is not a substitute for test weight calibration.*

Recorded Calibration factors can be entered to put the indicator back to a known working condition. The Calibrations Factors stored will change after every Single-Point and Four-Point Calibration. Recording of these factors is the last thing to be done before putting the scale in service.

See Calibration section.

### **32. Code 9092 - View Store Calibration Factors Standard**

#### **View / Set Angle Zero and Span NTEP**

Standard Program PR051G and later.

View the weight calibration values.

NTEP all versions. See *Out-of-Level Calibration*.

View and set Angle Zero and Angle Span values.

### **33. Code 9093 – View / Set Angle Factors**

All **NTEP** Program versions.

See Calibration section.

### **34. Code 9094 – Out-of-Level Calibration**

All **NTEP** Program versions.

See Calibration section.

### **35. Code 9095 – Print Calibration Factors**

**NTEP** Program versions.

Sends Calibration and Angle Factors out the RS232 port. Option must be installed. Data printed is the same as viewed in Code 9091 (Calibration Factors), Code 9092 (Angle Zero and Angle Span factors) and Code 9093 (Zone and Setpoint Factors).

---

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---

# CALIBRATION

---

**Note:** a Four-Point Linearity Calibration (code 9081) has been performed at the factory. In most cases, the Single-Point Calibration (code 9090) is the only calibration that will be required after installation.

## **36. Code 9090 – Single-Point Calibration**

Single-Point Calibration should be used to make minor calibration adjustments.  
Four-Point Linearity Calibration should be done if the load cell is being replaced.

Allow ample time for the indicator to warm up, generally 15-20 minutes.

- 36.1. Unload scale, ensure that the are not touching the floor and are level.

Press **SCALE ZERO** key.

- 36.2. Remove rear cover plate from the indicator.

- 36.3. Verify the mV jumper **JP1** is set properly to **1**, **2**, or **3** mV/V. Factory default is 3-mV/V.

- 36.4. Slide **CAL** switch to the left into the **CAL** position.

Display shows:

Press keys **9090**. Press **ENTER** key.

CAL SWITCH ON
---------------

- 36.5. **SINGLE POINT CAL**

Press **DEL** to select **YES**. Press **ENTER** key.

SINGLE POINT CAL
YES *NO

- 36.6. **ARE YOU SURE?**

Press **DEL** key to select **YES**. Press **ENTER** key.

ARE YOU SURE ?
YES *NO

- 36.7. **SET SCALE ZERO?**

Press **DEL** key to select **YES**. Press **ENTER** key.

**Note:** If emptying the scale is impossible select **NO** otherwise reset the scale zero by selecting **YES**.

SET SCALE ZERO ?
YES *NO

- 36.8. **WEIGHT =**

Apply test load (for best results apply at least 25% of scale capacity).

Wait until motion ceases.

Enter the value of the applied test load. Press **ENTER** key.

CAL MODE
WEIGHT = 0

- 36.9. Slide **CAL** switch to right to exit program mode.

CAL SWITCH ON
---------------

**Single-Point Calibration is finished.**

---

## **37. Code 9081 - Four-Point Linearity Calibration**

A Four-Point Linearity Calibration is generally not required after initial installation. Single-Point Calibration should be used. The Four-Point Calibration may be required in the event of load cell replacement or weight loads of increasing value are not linear.

- 37.1. Unload scale, ensure that the are not touching the floor and are level.

Press **SCALE ZERO** key.

- 37.2. Remove rear cover plate from the indicator

- 37.3. Verify the mV jumper **JP1** is properly set to **1, 2, or 3** mV/V. Default setting is 3-mV/V.

- 37.4. Slide **CAL** switch to the left into **CAL** position.

CAL SWITCH ON
---------------

Press keys **9081**. Press **ENTER** key.

**Note:** Pressing **ENTER** will use current value on the scale as zero value.

- 37.5. **DEL FACTORY CAL**

Press **DEL** key to select **YES**. Press **ENTER** key.

DEL FACTORY CAL
YES *NO

- 37.6. **ARE YOUR SURE?**

Press **DEL** key to select **YES**. Press **ENTER** key.

ARE YOU SURE?
YES *NO

- 37.7. **CALIBRATION STEP #1** - Apply first test load.

For best results apply approximately 25% of scale capacity.  
Wait until motion ceases.

Key in the value of the applied test load. Press **ENTER** key.

CAL STEP # 1
WEIGHT = XXXX

- 37.8. **CALIBRATION STEP #2** - Apply second test load.

For best results apply approximately 50% of scale capacity.  
Wait until all motion ceases.

If the reading is correct, press **ENTER** key.

If not, key in the value of the test load. Press **ENTER** key.

CAL STEP # 2
WEIGHT = XXXX

- 37.9. **CALIBRATION STEP #3** - Apply third test load.

For best results apply approximately 75% of scale capacity.  
Wait until all motion ceases.

If the reading is correct, press **ENTER** key

If not, key in the value of the test load. Press **ENTER** key.

CAL STEP # 3
WEIGHT = XXXX

- 37.10. **CALIBRATION STEP #4**

Apply fourth test load.

For best results apply approximately 100% of scale capacity.  
Wait until all motion ceases.

If the reading is correct, press **ENTER** key.

If not, key in the value of the test load. Press **ENTER** key.

CAL STEP # 4
WEIGHT = XXXXX

### **Calibration Complete**

This completes the Four-Point Linearity Calibration.

Slide **CAL** switch to right to exit program mode.

## 38. Out-of-Level Calibration

This procedure is to calibrate the DR2100A indicator with a Clinometer for Out-of-Level weighing. The scale base and DR2100A indicator should be installed per the installation instructions prior to performing this procedure. Out-of-Level calibration should be done after installation and before unit is placed into service.

**NTEP Scale Bases only. Must be equipped with out of level device (clinometer).**

**Warning:** Once this procedure has been started it ***MUST*** be completed in all 4 directions. Before starting read through this procedure completely. Make sure you understand the procedure and can tip the mast 3 degrees in all directions.

- 38.1. Apply power to the indicator. Allow 15-20 minutes for warm up.
- 38.2. Remove the cover from the back of the indicator.
- 38.3. Slide **CAL** switch to the left into the **CAL** position.
- 38.4. Press keys **9092**. Press **ENTER** key.

Top display line shows the gross weight.

Bottom display line shows: FB (front-to-back) angle  
LR (left-to-right) angle.

GROSS =	0
FB= X.X LR= X.X	

No load should on the scale at this time.

**Note:** the clinometer is mounted on top of the scale base.  
All references to the position of the truck while calibrating are made while sitting in the driver seat.

- 38.5. Level truck so both FB and LR angles are within  $0.0^\circ \pm 0.2^\circ$ .  
Level is obtained by tilting forks for Front-to-Back  
And moving to a flat location or tip truck for Left-to-Right.  
Move truck, (level condition) until: FB =  $+0.0^\circ$  ( $\pm 0.2^\circ$ )  
LR =  $+0.0^\circ$  ( $\pm 0.2^\circ$ )

GROSS =	0
FB=+0.0 LR= +0.0	

- 38.6. Press **DEL** key.

**Note:** **DO NOT** select "YES". Angle zero has been set at the factory.  
Do not change any of the numbers in the following steps unless instructed.

- 38.7. Press **ENTER** key.

SET ANGLE ZERO
YES *NO

- 38.8. Press **ENTER** key.

FB ANGLE ZERO
NUMBER = XXX

- 38.9. Press **ENTER** key.

LR ANGLE ZERO
NUMBER = XXX

- 38.10. Press **ENTER** key.

FB ANGLE SPAN
FACTOR = XXX

- 38.11. Press **ENTER** key.

LR ANGLE SPAN
FACTOR = XXX

- 38.12. Press **ENTER** key.

FRONT TO FRONT
YES *NO

CAL SWITCH ON
---------------

38.13. Slide **CAL** switch to the left into the **CAL** position.  
Press keys **9094**. Press **ENTER** key.

CAL SWITCH ON

38.14. Press **DEL** key to place the asterisk next to **YES**.  
Press **ENTER** key.

CALIB ANGLE FTRS  
YES \*NO

38.15. Key in the value of the test weight to be used.  
Press **ENTER** key.

TEST LOAD VALUE  
WEIGHT = XXXXX

Note: All references to position are made while sitting in the driver seat.

*CAUTION: care must be exercised when applying weight in an out-of-level condition. Bodily harm may occur from shifting weight.*

Top display line shows the position the truck is to be placed in.  
Bottom display line shows: FB (front-to-back) angle  
LR (left-to-right) angle  
Press **SCALE ZERO** key if weight value is not zero.

REAR UP 0  
FB=+0.0 LR= 0.0

38.16. Lift test load (value entered above for TEST LOAD VALUE).  
Tilt forks **forward 3 degrees** and tip truck so **level left-to-right**.  
FB = +3.0° (+/- 0.2°)  
LR = +0.0° (+/- 0.2°)  
Weigh value shown is the non-corrected weight.  
Wait for motion no motion. Press **ENTER** key.

REAR UP XXXX  
FB=+3.0 LR=+0.0

38.17. Tilt forks until **level front-to-back** and tip truck so **right side up 3 degrees**.  
FB = +0.0° (+/- 0.2°)  
LR = -3.0° (+/- 0.2°)  
Wait until all motion ceases. Press **ENTER** key.

RIGHT UP XXXX  
FB=+0.0 LR=-3.0

38.18. Tilt forks **backward 3 degrees** and tip truck so **level left-to-right**.  
FB = -3.0° (+/- 0.2°)  
LR = +0.0° (+/- 0.2°)  
Wait until all motion ceases. Press **ENTER** key.

FRONT UP XXXX  
FB=+0.0 LR=-3.0

38.19. Tilt forks until **level front-to-back** and tip truck so **left side up 3 degrees**.  
FB = +0.0° (+/- 0.2°)  
LR = +3.0° (+/- 0.2°)  
Wait until all motion ceases. Press **ENTER** key.  
**Out-of-Level calibration is complete.**  
Slide **CAL** switch to right to exit program mode.

LEFT UP XXXX  
FB=+0.0 LR=+3.0

CAL SWITCH ON

---

## **39. Calibration Verification NTEP**

- 39.1. Slide **CAL** switch to the left into the **CAL** position.  
Press keys **9092**.  
Press **ENTER** key.
- CAL SWITCH ON
- 39.2. Tilt forks front-to-back until level and position truck so left-to-right is level.  
FB = +0.0° (+/- 0.2°)  
LR = +0.0° (+/- 0.2°)  
Press **ZERO SCALE** key if necessary.
- GROSS = 0  
FB=+0.0 LR=+0.0
- 39.3. Lift known test load.  
Tilt forks front-to-back until level and position truck so left-to-right is level.  
FB = +0.0° (+/- 0.2°)  
LR = +0.0° (+/- 0.2°)  
Reading in tolerance? Repeat Single-Point calibration if necessary.
- GROSS = XXXXX  
FB=+0.0 LR=+0.0
- 39.4. Tilt forks **forward 3 degrees** and tip truck so **level left-to-right**.  
FB = +3.0° (+/- 0.2°)  
LR = +0.0° (+/- 0.2°)  
Reading in tolerance? Repeat Out-of-Level calibration if necessary.
- GROSS = XXXXX  
FB=+3.0 LR=+0.0
- 39.5. Tilt forks until **level front-to-back** and tip truck so **right side up 3 degrees**.  
FB = +0.0° (+/- 0.2°)  
LR = -3.0° (+/- 0.2°)  
Reading in tolerance? Repeat Out-of-Level calibration if necessary.
- GROSS = XXXXX  
FB=+0.0 LR=-3.0
- 39.6. Tilt forks **backward 3 degrees** and tip truck so **level left-to-right**.  
FB = -3.0° (+/- 0.2°)  
LR = +0.0° (+/- 0.2°)  
Reading in tolerance? Repeat Out-of-Level calibration if necessary.
- GROSS = XXXXX  
FB=-3.0 LR=-0.0
- 39.7. Tilt forks until **level front-to-back** and tip truck so **left side up 3 degrees**.  
FB = +0.0° (+/- 0.2°)  
LR = +3.0° (+/- 0.2°)  
Reading in tolerance? Repeat Out-of-Level procedure if necessary.
- GROSS = XXXXX  
FB=-0.0 LR=+ 3.0

## 40. Weight Calibration Numbers Standard and NTEP

This procedure can only be used after the initial calibration has been performed in the field and **all** numbers in this section have been recorded. Entering calibration numbers can be performed in the event that an electronics problem is encountered. This does not guarantee calibration is correct or within tolerance. Scale should always be tested using known test weight before placing unit back into service.

**This is not a substitute for a periodic calibration utilizing test weights.**

40.1. Slide **CAL** switch to the left into the **CAL** position.

40.2. **Standard** press **9091**, **NTEP** Press keys **9092**.  
Press **ENTER** Key.

CAL SWITCH ON
---------------

40.3. Record value.

LINEARITY STEP 1 OFFSET =	
------------------------------	--

40.4. Press **ENTER** key. Record value.

LINEARITY STEP 1 ADD-WT =	
------------------------------	--

40.5. Press **ENTER** key. Record value.

LINEARITY STEP 1 FACTOR =	
------------------------------	--

40.6. Press **ENTER** key. Record value.

LINEARITY STEP 2 OFFSET =	
------------------------------	--

40.7. Press **ENTER** key. Record value.

LINEARITY STEP 2 ADD-WT =	
------------------------------	--

40.8. Press **ENTER** key. Record value.

LINEARITY STEP 2 FACTOR =	
------------------------------	--

40.9. Press **ENTER** key. Record value.

LINEARITY STEP 3 OFFSET =	
------------------------------	--

40.10. Press **ENTER** key. Record value.

LINEARITY STEP 3 ADD-WT =	
------------------------------	--

40.11. Press **ENTER** key. Record value.

LINEARITY STEP 3 FACTOR =	
------------------------------	--

40.12. Press **ENTER** key. Record value.

LINEARITY STEP 4 OFFSET =	
------------------------------	--

40.13. Press **ENTER** key. Record value.

LINEARITY STEP 4 ADD-WT =	
------------------------------	--

40.14. Press **ENTER** key. Record value.

LINEARITY STEP 4 FACTOR =	
------------------------------	--

40.15. Press **ENTER** key. Record value.

SINGLE POINT CAL FACTOR =	
------------------------------	--

40.16. Press **ENTER** key. Record value.

SCALE ZERO NUMBER =	
------------------------	--

40.17. **Standard** unit, slide **CAL** switch to right to exit program mode. Recording complete.

**NTEP** unit, continue to *Angle Calibration Numbers*, next section.

## 41. Angle Calibration Numbers NTEP Only

41.1. NTEP Only, Press keys <b>9092</b> . Press <b>Enter</b> Key.	CAL SWITCH ON	
41.2. Press <b>DEL</b> key.	GROSS = 0 FB=+X.X LR=+X.X	
41.3. Press <b>ENTER</b> key. Note: <b>DO NOT</b> select "YES". Angle Zero set at the factory.	SET ANGLE ZERO YES *NO	
41.4. Press <b>ENTER</b> key. Record value.	FB ANGLE ZERO NUMBER =	
41.5. Press <b>ENTER</b> key. Record value.	LR ANGLE ZERO NUMBER =	
41.6. Press <b>ENTER</b> key. Record value.	FB ANGLE SPAN FACTOR =	
41.7. Press <b>ENTER</b> key. Record value.	LR ANGLE SPAN FACTOR =	
41.8. Press <b>ENTER</b> key. Record value.	FRONT TO FRONT *NO YES	
41.9. Press <b>9093</b> keys. Press <b>ENTER</b> key.	CAL SWITCH ON	
41.10. Record value:	ZONE 1 FACTOR NUMBER =	
41.11. Press <b>ENTER</b> key. Record value.	ZONE 2 FACTOR NUMBER =	
41.12. Press <b>ENTER</b> key. Record value.	ZONE 3 FACTOR NUMBER =	
41.13. Press <b>ENTER</b> key. Record value.	ZONE 4 FCTOR NUMBER =	
41.14. Press <b>ENTER</b> key. Record value.	ZONE 5 FACTOR NUMBER =	
41.15. Press <b>ENTER</b> key. Record value.	ZONE 6 FACTOR NUMBER =	
41.16. Press <b>ENTER</b> key. Record value.	ZONE 7 FACTOR NUMBER =	
41.17. Press <b>ENTER</b> key. Record value.	ZONE 8 FACTOR NUMBER =	
41.18. Press <b>ENTER</b> key. Record value.	ZONE 1 ANGLE SP NUMBER =	
41.19. Press <b>ENTER</b> key. Record value.	ZONE 2 ANGLE SP NUMBER =	
41.20. Press <b>ENTER</b> key. Record value.	ZONE 3 ANGLE SP NUMBER =	
41.21. Press <b>ENTER</b> key. Record value.	ZONE 4 ANGLE SP NUMBER =	
41.22. Press <b>ENTER</b> key. Record value.	ZONE 5 ANGLE SP NUMBER =	
41.23. Press <b>ENTER</b> key. Record value.	ZONE 6 ANGLE SP NUMBER =	
41.24. Press <b>ENTER</b> key. Record value.	ZONE 7 ANGLE SP NUMBER =	
41.25. Press <b>ENTER</b> key. Record value.	ZONE 8 ANGLE SP NUMBER =	

Slide the **CAL** switch to right to exit program mode.