

# ZT-1

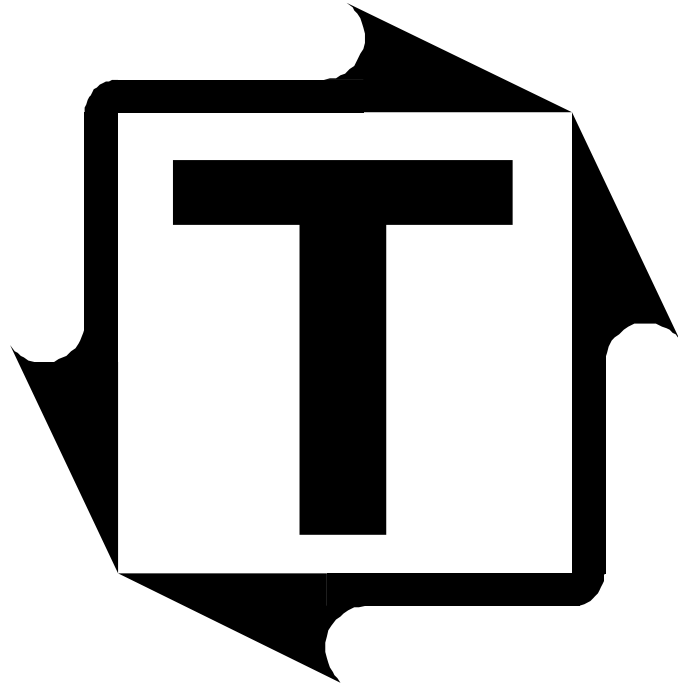


## Tonnage Load Module

By Toledo Integrated Systems

## User's Manual





**ZT-1**  
**Load Module**  
**User's Manual**

Revision: A

**THIS PAGE  
INTENTIONALLY  
LEFT BLANK**



## Table of Contents

---

Limited Warranty .....	4
Features Overview .....	5
Specifications .....	7
Installation .....	9
Mounting the ZT-1 .....	9
DC Power Connection .....	10
Shunt Resistor Selection .....	11
Tonnage Gage Sensor Connection .....	12
20mA-out Sensor Connection.....	16
10V-out Sensor Connection.....	18
Analog Voltage Output .....	20
Analog Current Output.....	21
Triggering – Internal Threshold.....	22
Triggering – External Probe.....	23
Calibration .....	25
Operation .....	31
Appendix .....	35
A) Sensor Installation (Doc# 11080).....	35
B) Calibration Sheets (2) (Form# 1224).....	35

## Table of Figures

---

Figure 1: Mounting Dimensions .....	9
Figure 2: DC Power Wiring .....	10
Figure 3: Built-In 1M Ohm Shunt Resistor Wiring .....	11
Figure 4: External Shunt Resistor Installation.....	11
Figure 5: Strain Gage Sensor Input.....	13
Figure 6: Strain Gage Sensor Cable Stripping.....	14
Figure 7: Strain Gage Sensor Wiring.....	15
Figure 8: 20mA-out Sensor Input.....	17
Figure 9: 10V-out Sensor Input.....	19
Figure 10: Analog Voltage Output Wiring .....	20
Figure 11: Analog Current Output Wiring .....	21
Figure 12: Internal Threshold Wiring .....	22
Figure 13: Probe Input Wiring.....	23
Figure 14: Probe Timing Diagram.....	24
Figure 15: Calibration Gain Voltage Measurement.....	29
Figure 16: Calibration Card Sample .....	30



## Limited Warranty

---

This unit is warranted by the manufacturer, Toledo Transducers, Inc., to be free of defects in workmanship and materials for one year from date of manufacturer's shipment. This warranty is limited to repairing or replacing products which manufacturer's investigation shows were defective at the time of shipment by the manufacturer.

All products subject to this warranty must be returned for examination, repair or replacement

F.O.B. to: Toledo Transducers, Inc.  
6834 Spring Valley Drive  
Holland, Ohio 43528

***The express warranty set forth herein is in lieu of all other warranties, expressed or implied, including without limitation any warranties of merchant-ability or fitness for a particular purpose. All such warranties are hereby disclaimed and excluded by the manufacturer.***

Repair or replacement of defective products as provided above is the sole and exclusive remedy provided thereunder. The manufacturer shall not be liable for any further loss, damages, or expenses, including incidental or consequential damages, directly or indirectly arising from the sale or use of this product.

Any unauthorized repair voids this warranty.

There are no warranties that extend beyond those expressly set forth herein.



## **Features Overview**

- Designed to work with strain gage sensors and load cells. The ZT-1 can also accept input from 4-20mA current output sensors or voltage output sensors.
- Simultaneously provides normal peak, reverse peak, and track voltage outputs. Also simultaneously provides the associated 0-20mA current outputs.
- Built-in threshold trigger simplifies installation. External probe trigger can also be used when situation required.
- LED bar-graph voltmeter for easy setup and diagnostic.
- Built-in 1 Mega Ohm calibration shunt resistor. User selected external shunt resistor can be used for load cell applications.
- x1 and x10 amplifier gain ranges to work with either strong or weak signal from the load sensor.
- Auto-Zero can be selected using dip switches to compensate for zeroing errors caused by environmental changes such as temperature, humidity, and etc.
- Electrical noise rejection filter can be enabled when situation required.
- Plug-in connectors for easy wiring and installation.
- Standard DIN Rail mount simplifies systems integration.
- Modular with common bus design allows future upgrade and expansion.

The ZT-1 tonnage load module is designed for critical force measurement applications where accuracy, extreme stability, and dependable noise rejection is essential. It is equipped with an LED bar-graph voltmeter for easy setup and diagnostic. The ZT-1 is DIN rail mountable and is designed to interface with a PLC analog card and to display output through a human machine interface (HMI).



**THIS PAGE  
INTENTIONALLY  
LEFT BLANK**





## **Specifications**

Transducers	Full bridge, 120 to 1000 ohms.
Sensor Excitation	Built in +10VDC at 250mA max.
Balance Range	+/- 1mV/V of sensor imbalance
Gain Ranges	Low range = x50 to x550 adjustable High range = x500 to x5,500 adjustable
Calibration Shunt	Built-in 1 mega ohm (.1%), or external custom shunt.
Output Range - Voltage	Normal Peak and Reverse Peak = 0 to 10VDC Track output = -10 to +10VDC
Output Range - Current	Normal Peak and Reverse Peak = 0 to 20mA Track output = -20 to +20mA
Circuit Inaccuracy	+/- .1% of full scale max.
Circuit Non-linearity	+/- .02% of full scale max.
Auto Zero	Time constant = 10 seconds. DIP switch selectable.
Frequency Response	DC to 5,000 Hz
Speed Limit	2000 SPM max. when triggered by External Probe 500 SPM max. when triggered by Internal Threshold
Operating Temperature	-4 to 158 degree F, or -20 to 70 degree C
Display	LED bar-graph voltmeter for setup and diagnostic
Trigger	Internal Threshold (.35V / .70V), or External Probe.
Probe Input	NPN/PNP proximity probes, solid state or dry contact relays. Built-in 24VDC at 80mA max. supplies power to the probe.
Input Power	24VDC at 300mA max. Automatic resettable fuse.
Dimensions	0.9" W x 4.1" H x 4.7" D
Mounting	Standard DIN Rail mount



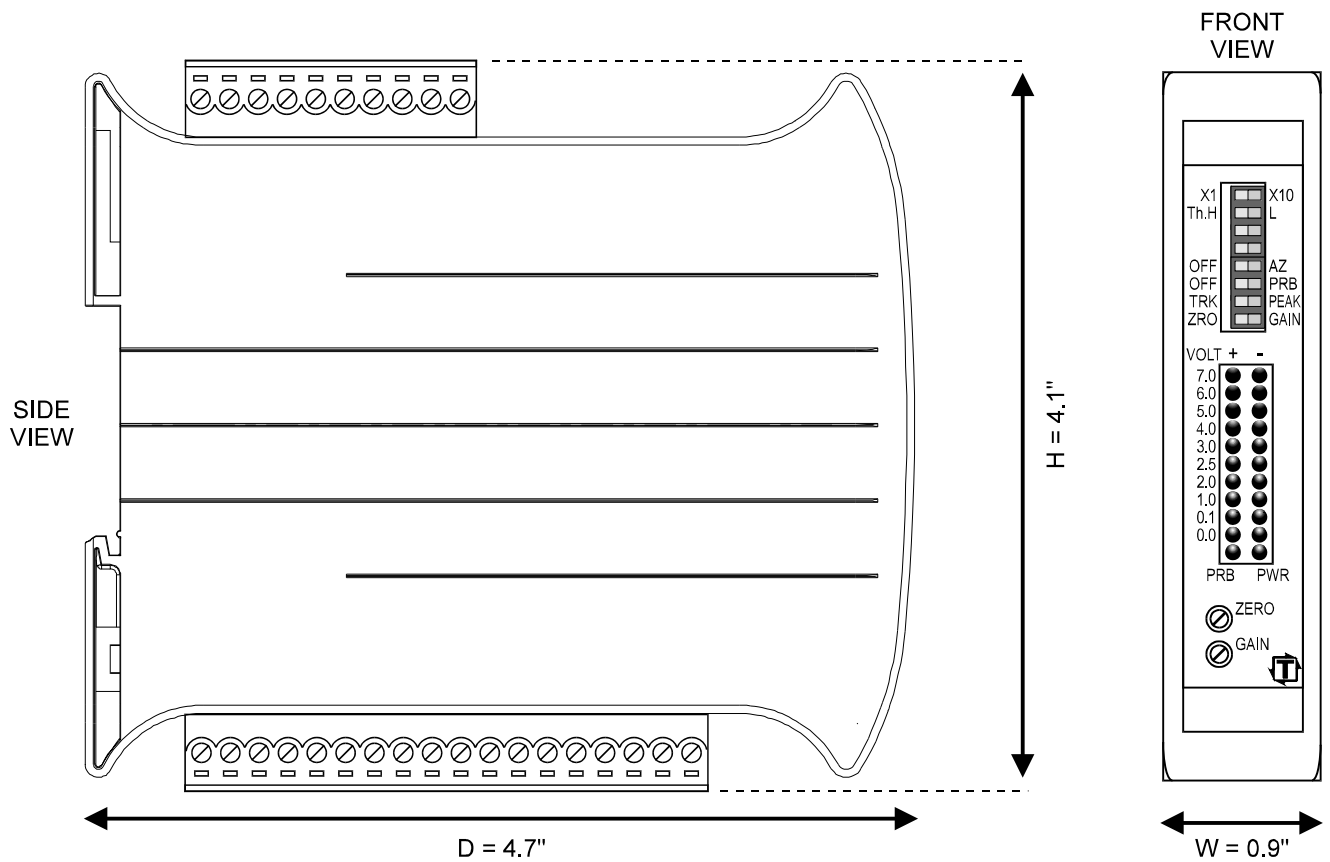
**THIS PAGE  
INTENTIONALLY  
LEFT BLANK**



## ➤ Installation

### Mounting the ZT-1

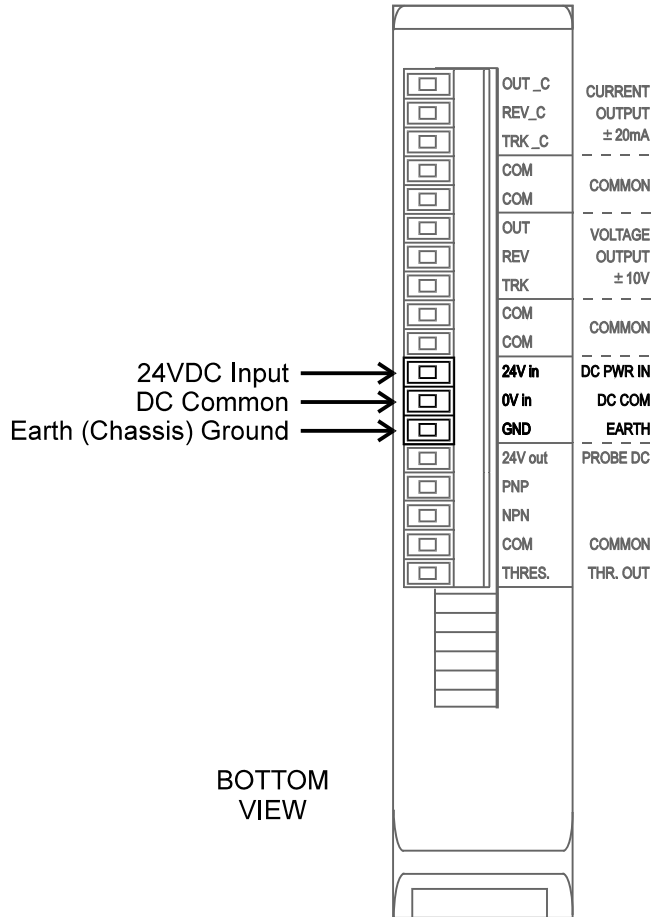
The ZT-1 is designed to clip onto standard top hat DIN rail (TH 35-7.5 or TH 35-15).



**Figure 1: Mounting Dimensions**

## DC Power Connection

24VDC power is connected to the ZT-1 as shown in Figure 2.



**Figure 2: DC Power Wiring**

### Notes:

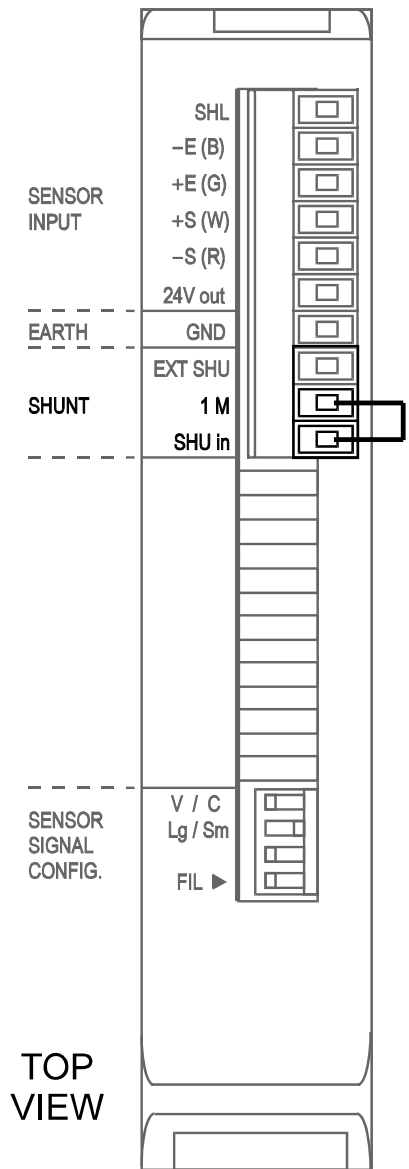
- 1) The 24VDC source can be in range from 18VDC to 32VDC.
- 2) It is important to connect an Earth Ground to the GND terminal.
- 3) Do not apply power until all the wirings in this Installation Section are done.



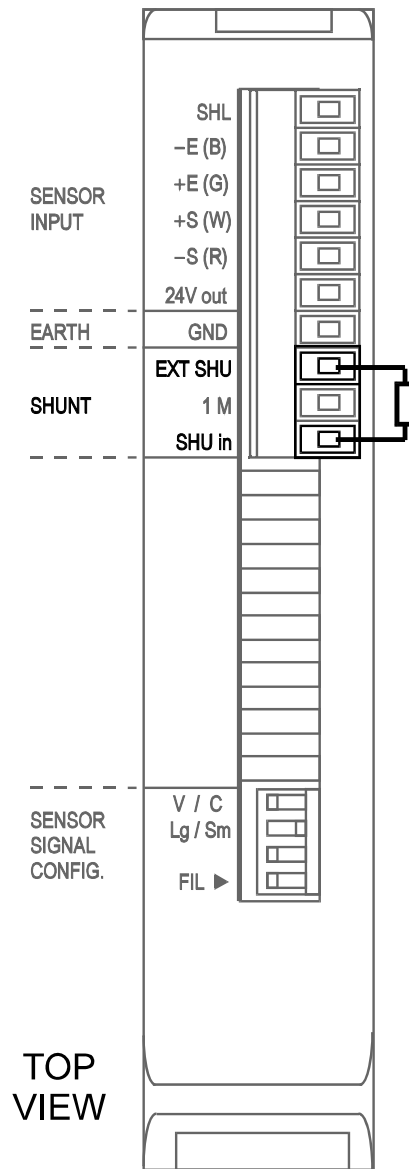
## Shunt Resistor Selection – Strain Gage Sensor only

Skip this section if you are not using a strain gage sensor. Shunt resistor only works directly with the Wheatstone bridge type sensor.

The ZT-1 is capable of utilizing either a standard 1M ohm built-in shunt resistor or a user-specified external shunt resistor.



OR



**Figure 3:  
Built-In 1M Ohm Shunt  
Resistor Wiring**

**Figure 4:  
External Shunt  
Resistor Installation**

## Strain Gage Sensor Connection

Refer to Figure 5 for the procedures below:

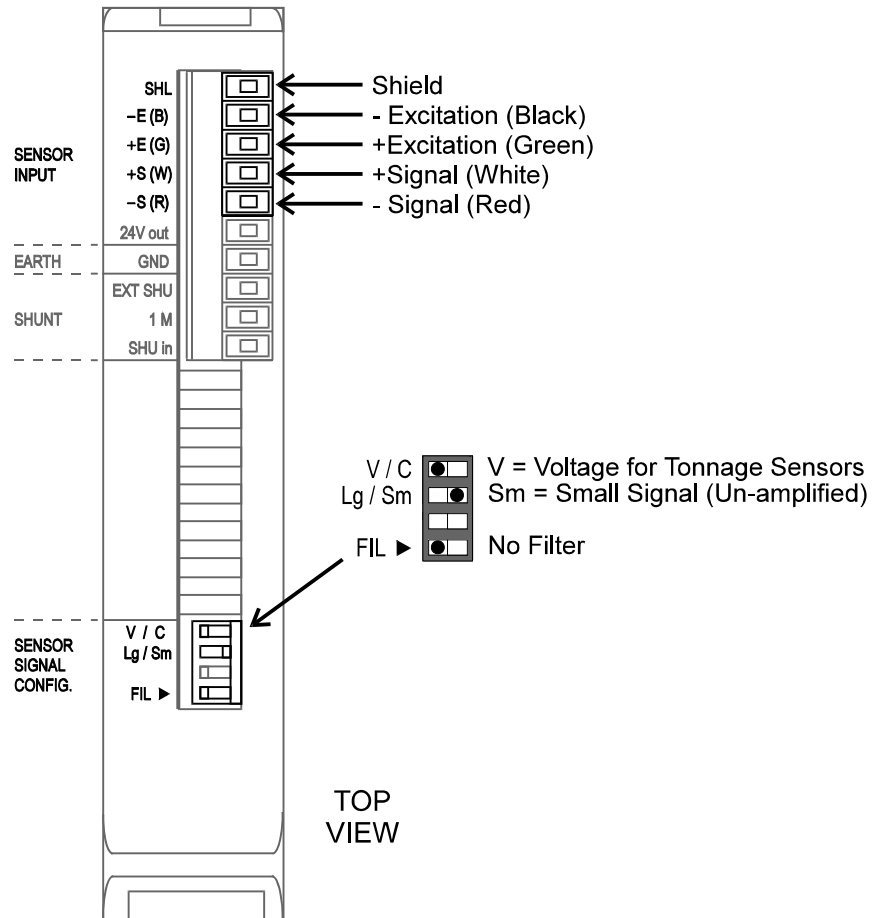
Connection:

- 1) Prepare the sensor cable for termination as described in Illustration A on page 14.
- 2) Remove the Phoenix plug from its socket on the top of the unit and wire the sensor cable as described in Illustration B on page 15.
- 3) The Phoenix plug can then be inserted back into its socket.

Configuration:

- 1) Set the V / C dip switch to “V” position for voltage sensor. Strain Gage sensor outputs voltage signal.
- 2) Set the Lg / Sm dip switch to “Sm” position for small signal. Strain Gage sensor outputs un-amplified signal (small signal).
- 3) Set FIL dip switch to “No filter” position. Apply this filter only when electrical noise becomes a problem at the ZT-1 analog outputs.

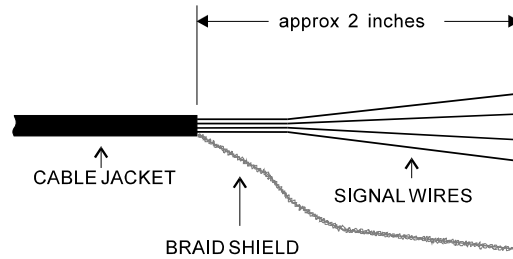




**Figure 5: Strain Gage Sensor Input**

## Illustration A - Sensor Cable Termination

- 1) Strip the sensor cable as shown in Figure 6 below. Be sure not to nick any of the signal conductors or cut the braid shield.



**Figure 6: Strain Gage Sensor Cable Stripping**

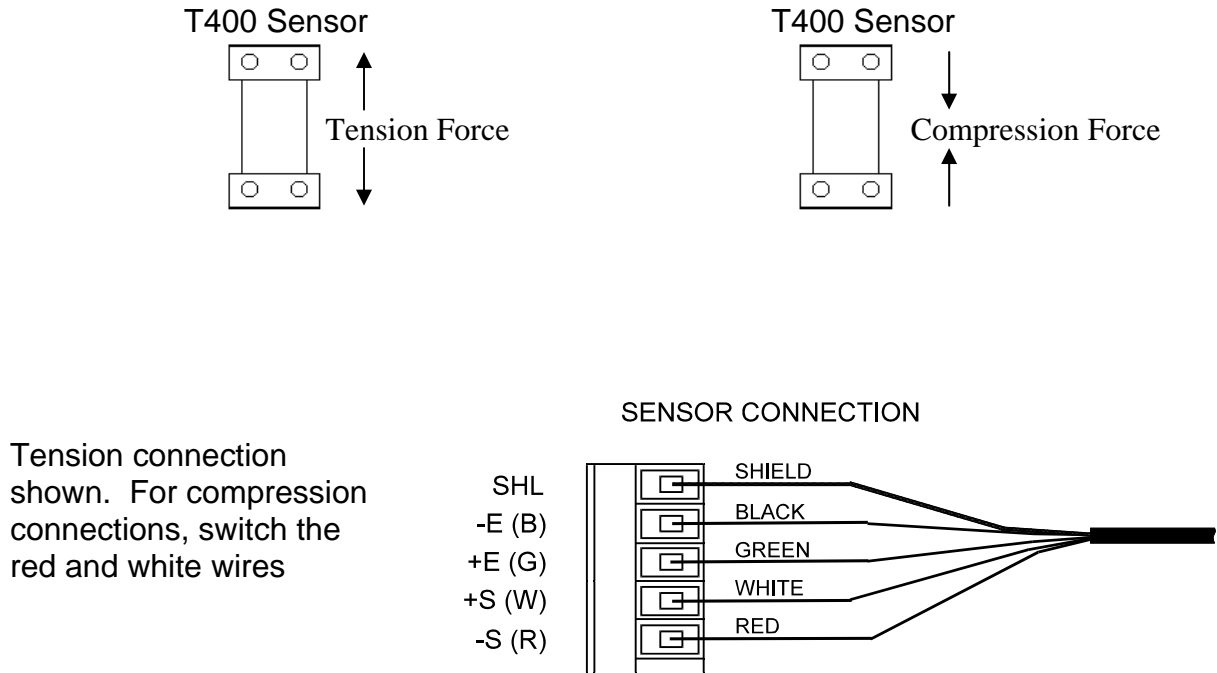
- 2) Strip approximately  $\frac{1}{4}$ " of insulation from each of the four signal conductors.

**Note:** If your sensor cable is not double shielded with both foil and a braid, electrical noise may affect your output readings.



### Illustration B - Sensors Connection

The ZT-1 accepts the signals from Toledo Transducers T-400 sensors as well as other strain gage sensors. Figure 7 illustrates the sensor connections.



**Figure 7: Strain Gage Sensor Wiring**

## 20mA-out Sensor Connection

The 20mA-out Sensor applies to sensors with output up to +/-20mA including the 4-20mA output sensor. Refer to Figure 8 for the procedures below:

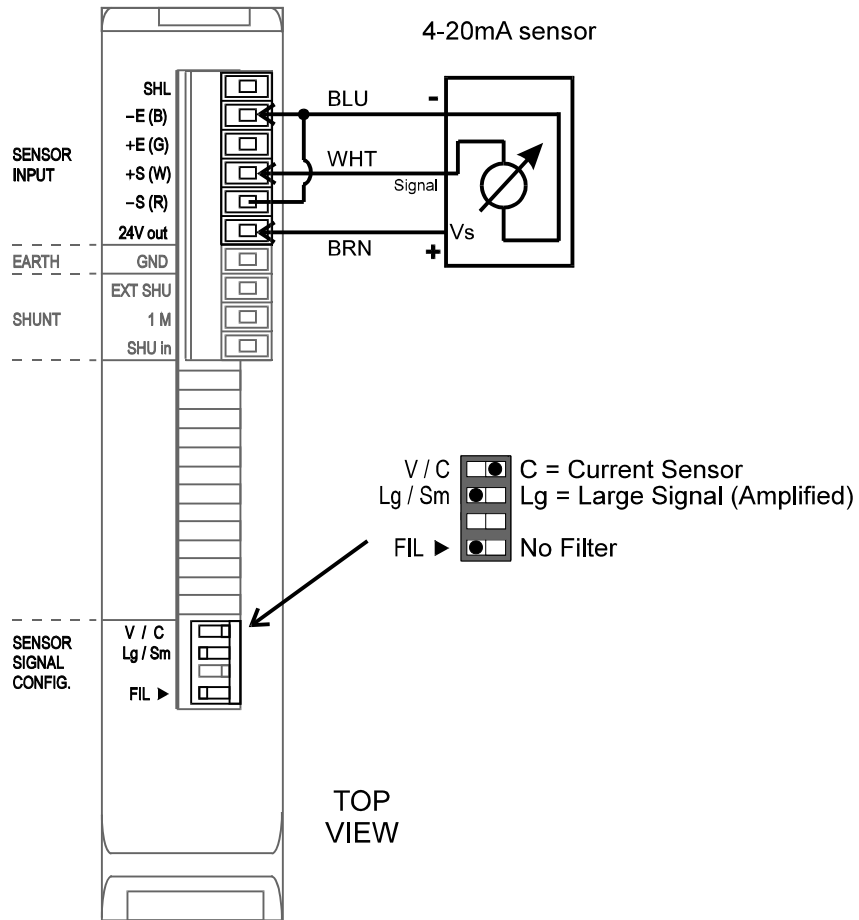
Connection:

- 1) Remove the Phoenix plug from its socket on the top of the unit and wire the sensor cable as shown.
- 2) The Phoenix plug can then be inserted back into its socket.

Configuration:

- 1) Set the V / C dip switch to "C" position for current output sensor. 20mA-out sensor outputs current signal.
- 2) Set the Lg / Sm dip switch to "Lg" position for large signal. 20mA-out sensor outputs amplified signal (large signal).
- 3) Set FIL dip switch to "No filter" position. Apply this filter only when electrical noise becomes a problem at the ZT-1 analog outputs.





**Figure 8: 20mA-out Sensor Input**

## 10V-out Sensor Connection

The 10V-out Sensor applies to sensors with output up to +/-10V. Refer to Figure 9 for the procedures below:

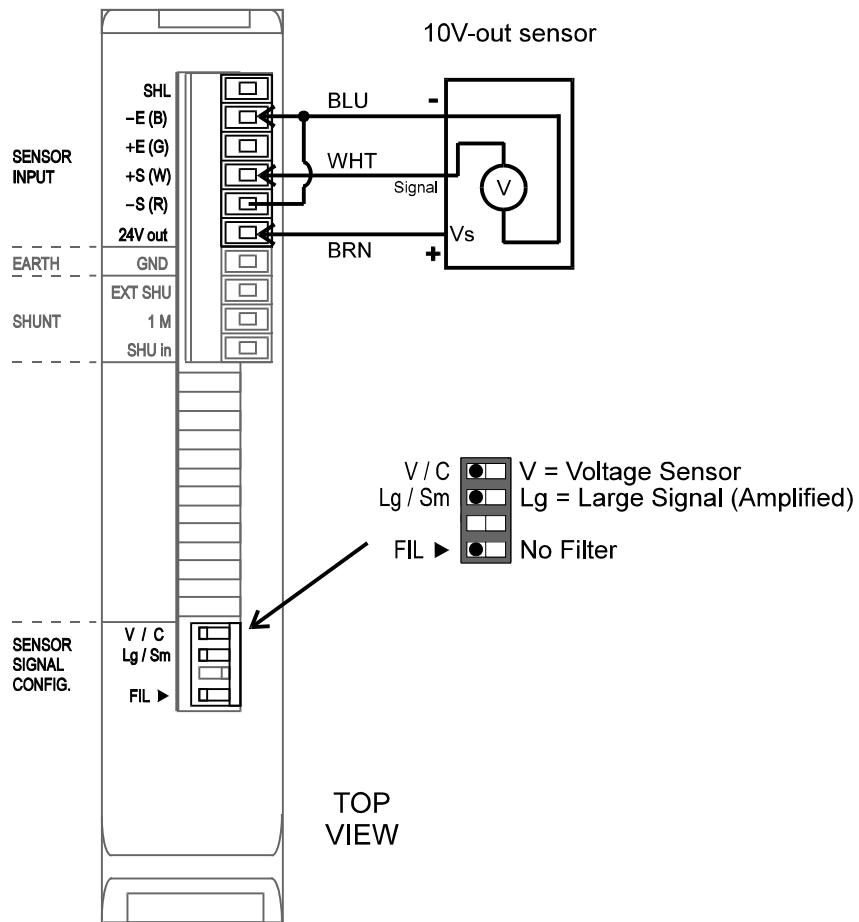
Connection:

- 1) Remove the Phoenix plug from its socket on the top of the unit and wire the sensor cable as shown.
- 2) The Phoenix plug can then be inserted back into its socket.

Configuration:

- 1) Set the V / C dip switch to “V” position for voltage sensor. 10V-out sensor outputs voltage signal.
- 2) Set the Lg / Sm dip switch to “Lg” position for large signal. 10V-out sensor outputs amplified signal (large signal).
- 3) Set FIL dip switch to “No filter” position. Apply this filter only when electrical noise becomes a problem at the ZT-1 analog outputs.

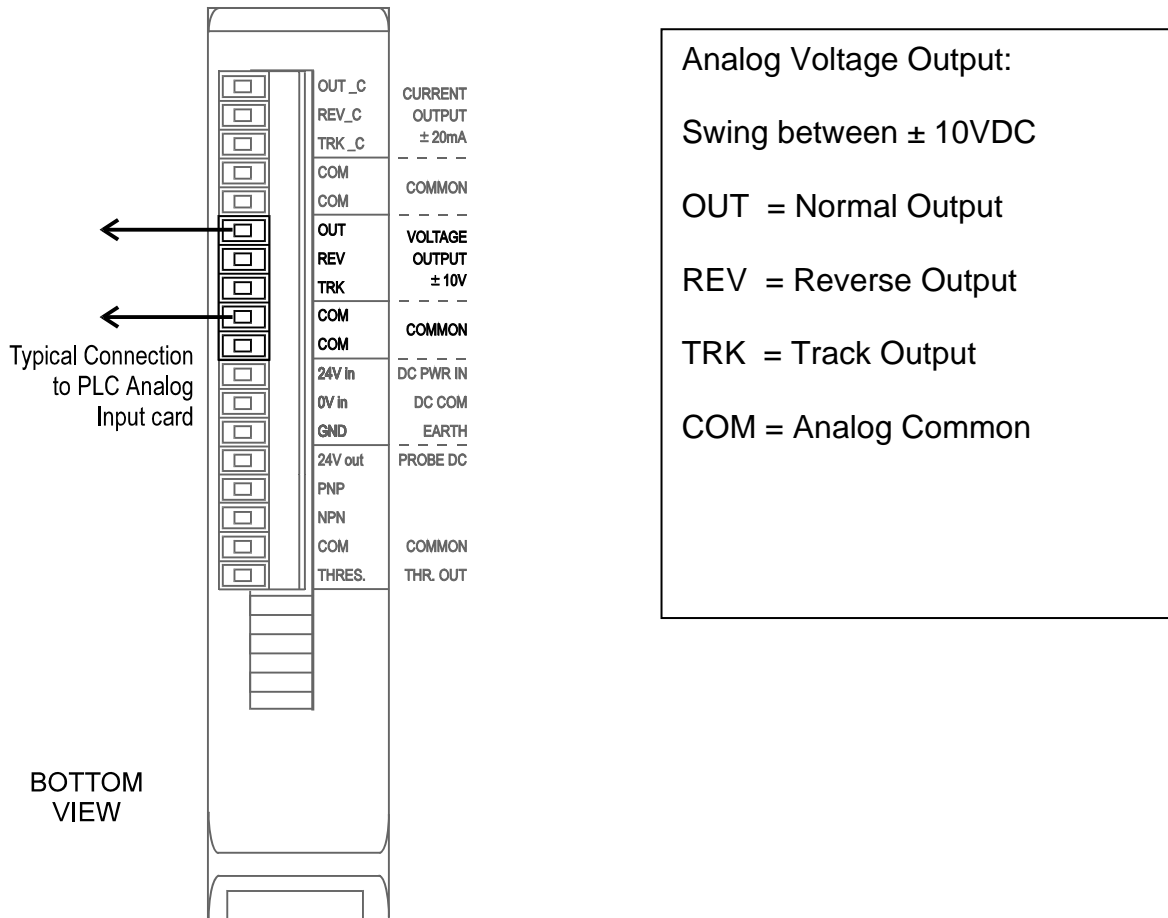




**Figure 9: 10V-out Sensor Input**

## Analog Voltage Output

The analog voltage output is provided on a Phoenix connector for easy access and for interfacing with other peripherals.



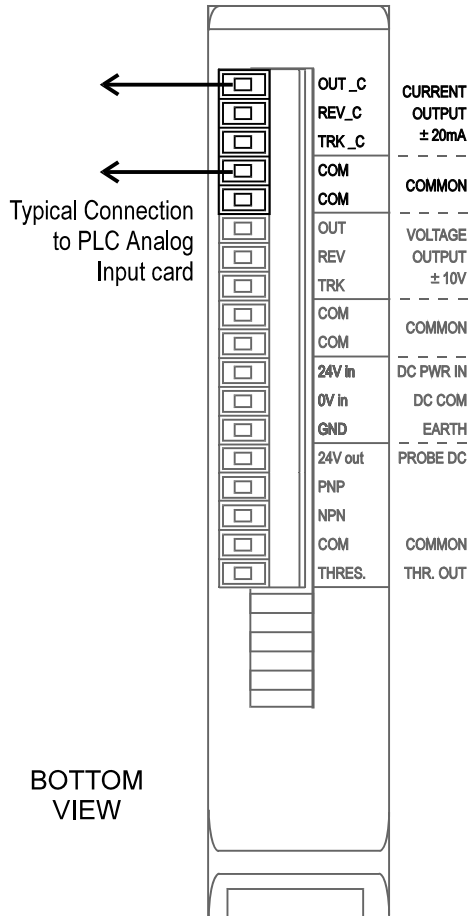
**Figure 10: Analog Voltage Output Wiring**

Output details:

- OUT terminal outputs either Peak tonnage or Track tonnage, depending on the TRK/PEAK switch setting on the front panel.
- REV terminal outputs the reverse peak (snap-through) tonnage when the front panel TRK/PEAK switch is set to PEAK.
- TRK terminal always outputs the track tonnage, regardless of the front panel TRK/PEAK switch.

## Analog Current Output

The analog current output is provided on a Phoenix connector for easy access and for interfacing with other peripherals.



Analog Current Output:  
 Swing between  $\pm 20\text{mA}$   
 OUT\_C = Normal Output  
 REV\_C = Reverse Output  
 TRK\_C = Track Output  
 COM = Analog Common

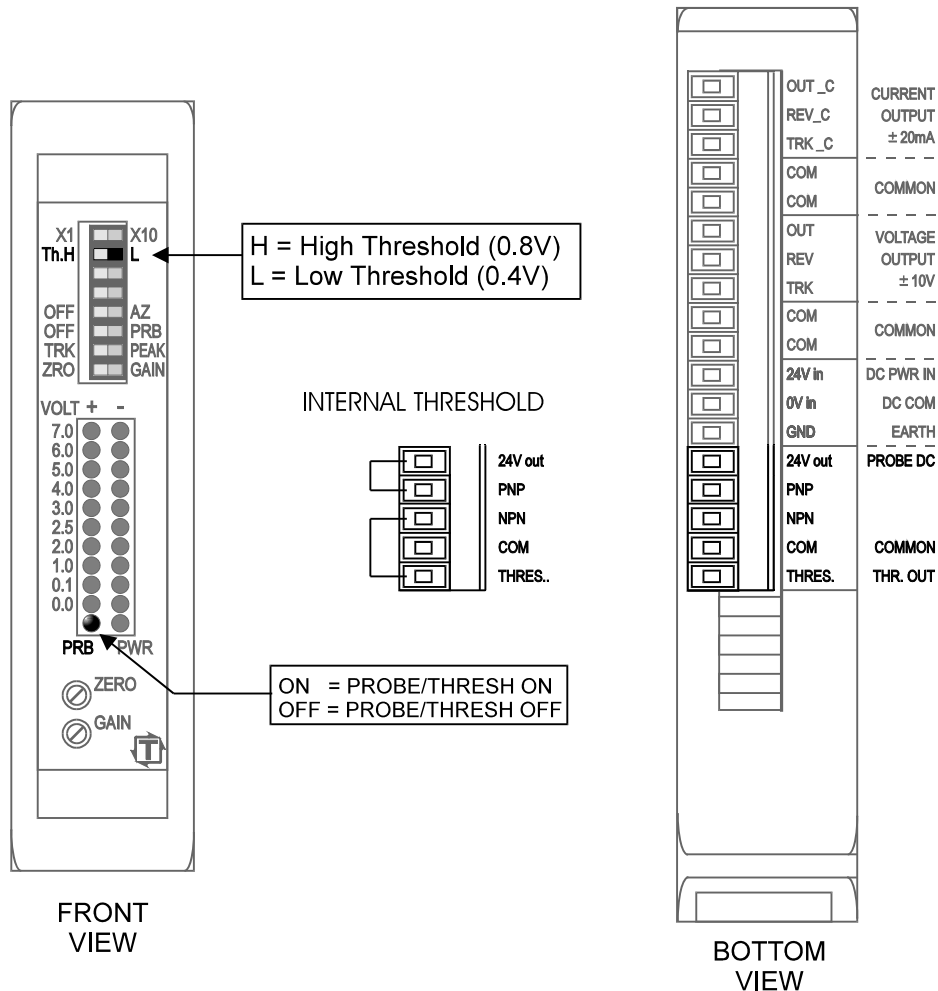
**Figure 11: Analog Current Output Wiring**

Output details:

- OUT\_C terminal outputs either Peak tonnage or Track tonnage, depending on the TRK/PEAK switch setting on the front panel.
- REV\_C terminal outputs the reverse peak (snap-through) tonnage when the front panel TRK/PEAK switch is set to PEAK.
- TRK\_C terminal always outputs the track tonnage, regardless of the front panel TRK/PEAK switch.

## Triggering – Internal Threshold

The ZT-1 can be triggered by an internal threshold value. When this triggering method is used, the ZT-1 begins monitoring when the load rises above the level determined by the front panel's **Th.H / L** switch. Refer to Figure 12 below to configure the ZT-1 for threshold triggering.



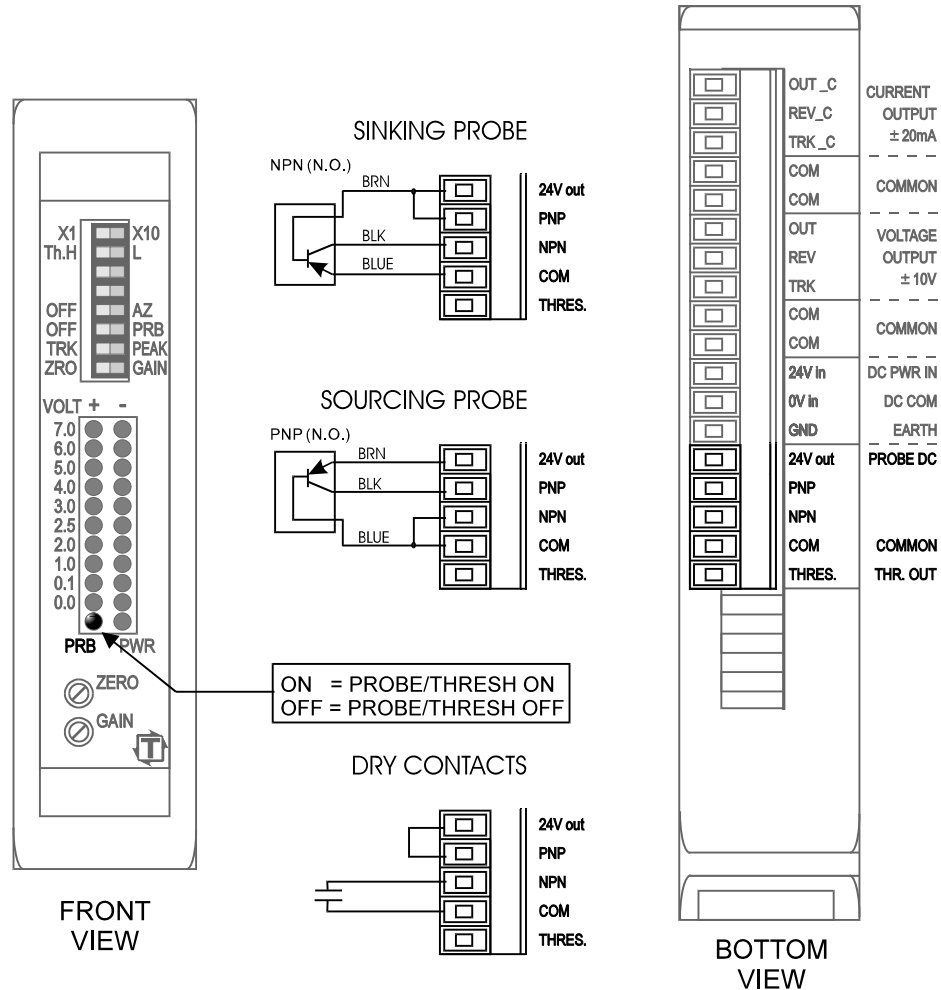
**Figure 12: Internal Threshold Wiring**

The probe (PRB) indicator should turn on when the load rises above the threshold value, and turn off when the load falls back below the threshold value.



## Triggering – External Probe

The ZT-1 can be triggered by an external probe signal. If an external probe is used, the probe supply voltage (+24VDC) is provided by the ZT-1. The figure below illustrates the wiring for a variety of sensing devices.



**Figure 13: Probe Input Wiring**

The probe (PRB) indicator should turn on when the probe turns on, and turn off when the probe turns off.

If the front panel Auto-Zero switch is enabled, the ZT-1 will remain in the auto-zeroing mode of operation until an external probe is applied.

The auto zero feature is important for accurate readings. Over time the press frame will slightly change in its structure. This may be due to temperature or press frame tension. The ZT-1 will compensate for the slight change. It will readjust the zero base line. This zero base line is the no-load value of the press. With a consistent zero value, the tonnage output readings should remain accurate.

When the probe turns on, the ZT-1 opens the window to read a load signal. In peak mode the load level rises to the highest value.

When the probe turns off, the peak level is held at its high level and the auto-zeroing function is resumed (Notice the dotted line below). The peak level is reset the next time the probe transitions from off to on.

The timing of the probe should be such that it turns on just before the machine begins generating a load (140°) and remains on until the load is removed (240°).

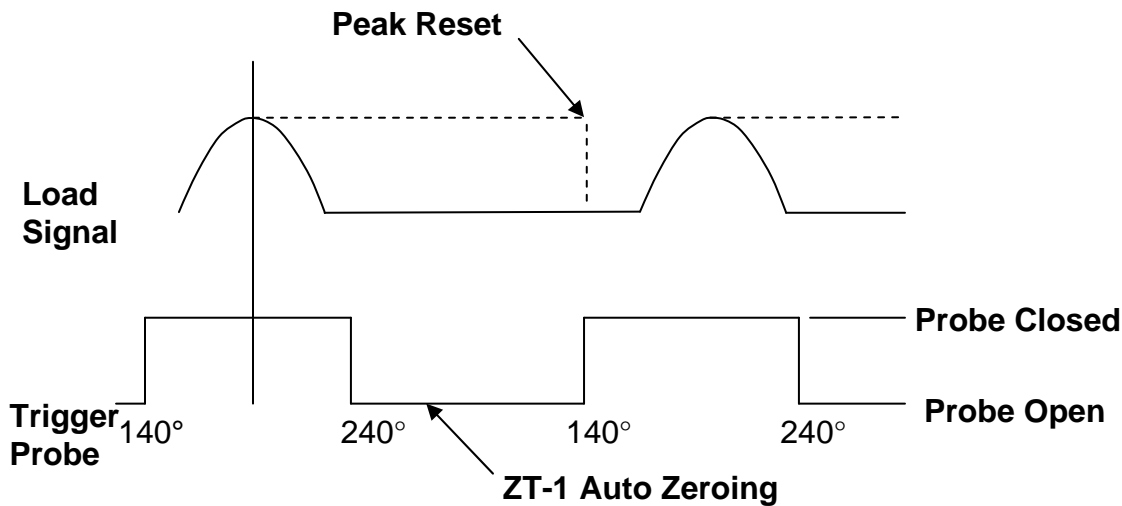
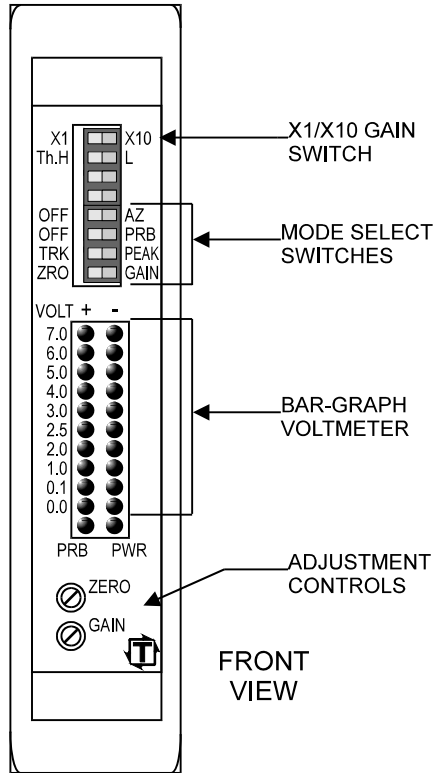


Figure 14: Probe Timing Diagram

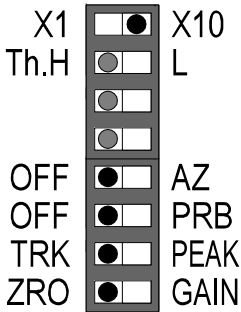
## ➤ Calibration

Refer to the diagram below for control locations.



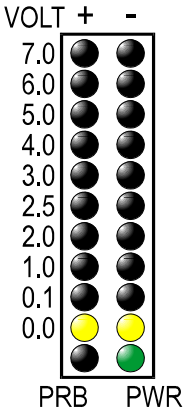
- 1) With the sensor placed in the best possible location, (see appendix A), torque the sensor down to 150 in-lbs on the sensor bolts. Do not put the sensor enclosure cover on yet. You will need to test the sensor location.
  
- 2) Find the shut height of the press.
  - Jog the press until the ram is at bottom dead center (BDC) or 180° without the load cell or die in the press.
  
  - Determine the amount of spacers needed with your load cell. Cycle the press without the load cell to insure correct height.

- 3) Place the load cell in the correct position in the press.
  - The load cell should be placed so that it is centered in the press.
  - Cycle the press without hitting the load cell first.
  - Place cardboard on the top and bottom of the load cell.
- 4) Toggle the mode select switches to AZ OFF, PRB OFF, TRACK, ZERO. Also, set the Gain switch to X10 to start.



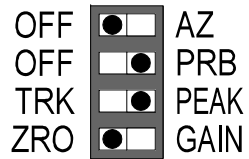
- 5) Balance the tonnage sensor.
  - Adjust the ZERO pot until the Bar-graph Voltmeter has only the 2 yellow **0.0V** LEDs lit. This indicates a balanced or zeroed state.

Note: Using the built-in bar-graph voltmeter for calibration will achieve calibration accuracy of +/-1% of capacity. If more accurate result is needed, use a digital voltmeter to measure the voltage across the OUT and COM terminals (see Figure 15).



6) Cycle the press.

- Set the mode switches to AZ OFF, PRB, PEAK, and ZERO.



- Further adjust the shut height so that the press impacts the load cell and generates a load at 100% of press capacity. See warning below.

**WARNING**

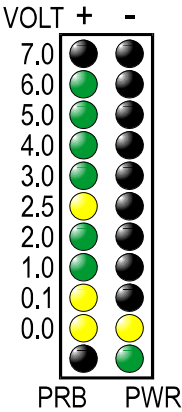
Depending on the press capacity and the size of the load cells being used, loading the press at capacity with load cells could indent the ram or bolster. If this is a concern, you may choose to calibrate the press only up to 80% of capacity.



7) Adjust the gain.

- Run the press for 2 cycles at capacity.
- Compare the voltage level on the Bar-graph Voltmeter with the load cell's display.
- Adjust the GAIN pot.
- Repeat until the desired voltage LED just turns on.  
For example, +6.0V at 100.0 tons.

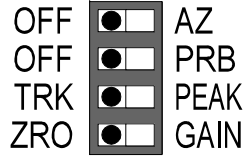
Note: Use the 6.0 VOLT LED in the built-in bar-graph voltmeter as an example. When this LED is on, it could mean a voltage anywhere from 6.0 volt to 6.9 volt. But when this LED just changes state from off to on, it indicates an accurate reading of 6.0 volt. This characteristic applies to all LED's in this built-in bar-graph voltmeter.



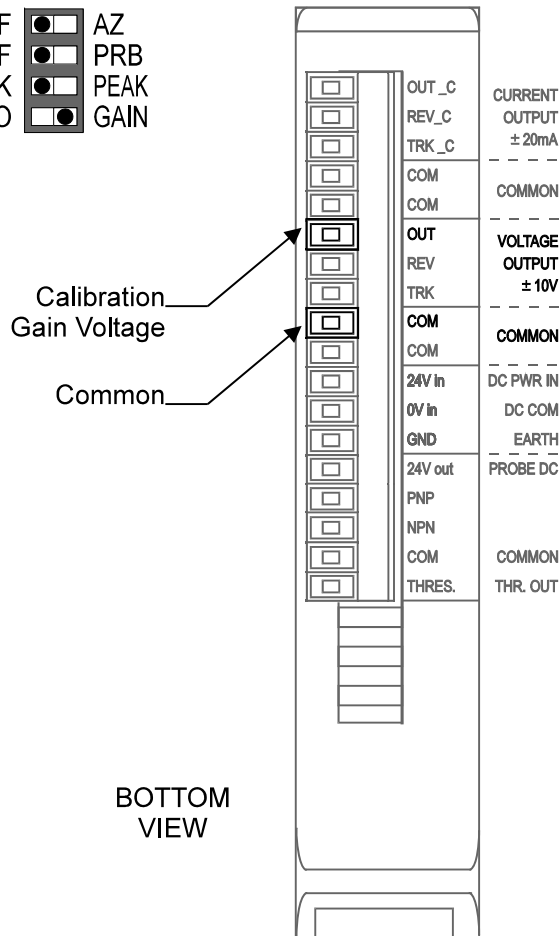
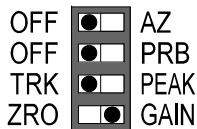
- If less gain is needed, change the Gain switch to X1, then repeat from Step 4.

8) Record the Calibration Gain Voltage.

- Set the mode switches to AZ OFF, PRB OFF, TRK, and ZERO as shown, and verify that the sensor is at zero.



- Set the ZRO/GAIN switch to GAIN and use a digital voltmeter to measure the voltage across the OUT and COM terminals. Record this value as the Calibration Gain Voltage.



**Figure 15: Calibration Gain Voltage Measurement**

9) Calibration complete.

- Fill in the Calibration Card (a sample shown below) which is located in the side pocket.
- Set mode switches as shown.

OFF  AZ  
 OFF  PRB  
 TRK  PEAK  
 ZRO  GAIN


<b>Model ZT-1</b>		Serial No. <u>A1501</u>	
Calibrated By: <u>John Doe</u>		Date: <u>1-1-2015</u>	
<b>Mode Switch</b> (Fill In Switch Position)		<b>Sensor Config.</b> (Fill In Switch Position)	
X1 <input checked="" type="checkbox"/> X10 Th.H <input checked="" type="checkbox"/> L  OFF <input checked="" type="checkbox"/> AZ OFF <input checked="" type="checkbox"/> PRB TRK <input checked="" type="checkbox"/> PEAK ZRO <input checked="" type="checkbox"/> GAIN	Shunt: _____ Ohm (if EXT used)	V / C <input checked="" type="checkbox"/> Lg / Sm <input checked="" type="checkbox"/>  FIL ▶ <input checked="" type="checkbox"/>	Gain: <u>3.25</u> VDC
 Toledo Integrated Systems    Holland, OH    Made in the USA Toledo Transducers, Inc.			

Figure 16: Calibration Card Sample

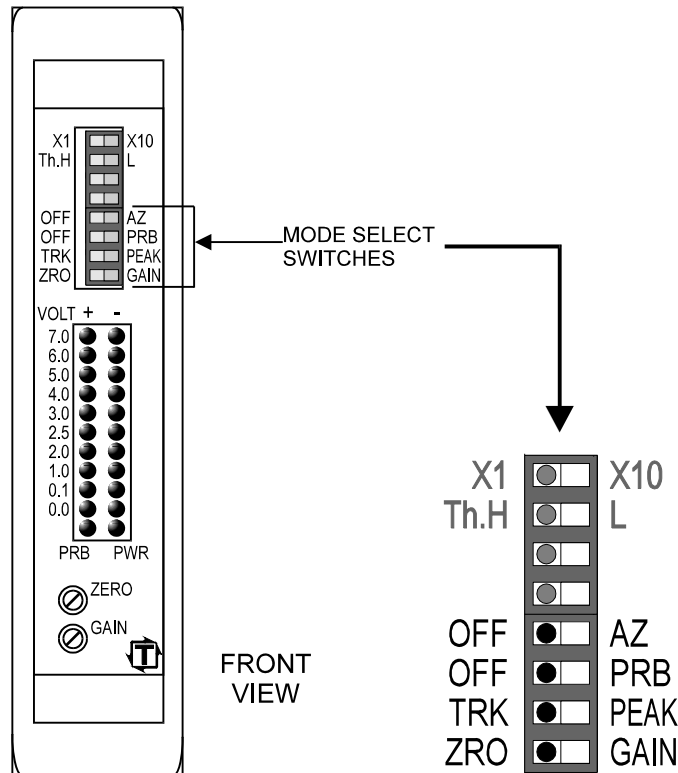


## ➤ Operation

Once the ZT-1 has been calibrated, it is ready for continuous use. This section details the setup for Peak Mode and Track Mode operations.

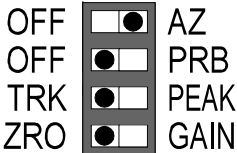
### 1) Peak Mode operation

In Peak Mode, the output will increase to the highest load level and remain at that voltage until the probe transitions from off to on again.



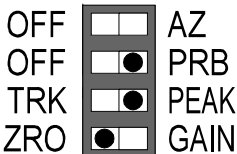
- 1) Set the Mode Select Switches to AZ OFF, PRB OFF, TRK, and ZRO as shown above.

- 2) Skip this step if Auto-Zero is not needed.
  - a) Toggle the OFF/AZ switch to AZ to start Auto-Zero.



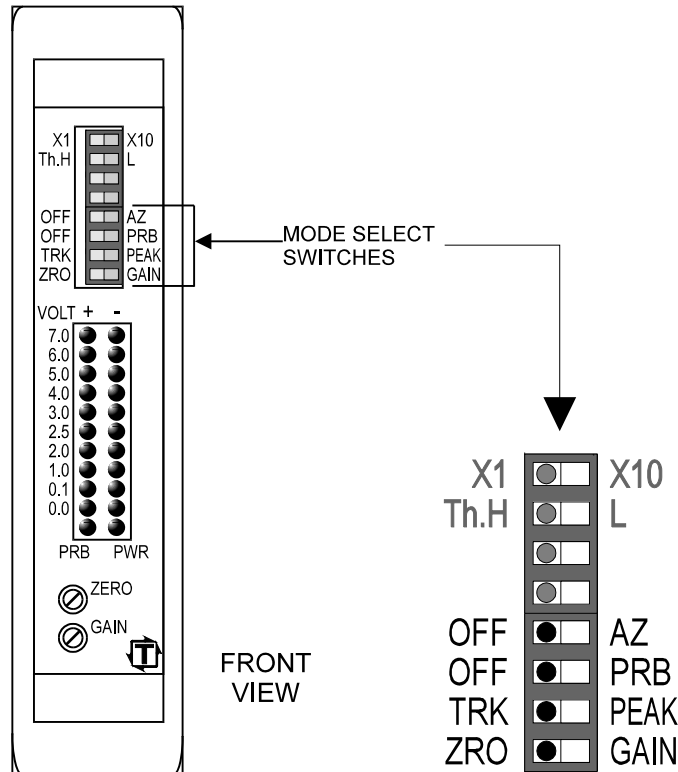
- b) When Auto-Zero is done, only the 2 yellow LEDs at 0.0V are lit.

- 3) Set the OFF/PRB switch to PRB and set the TRK/PEAK switch to PEAK.

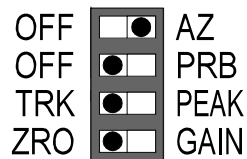


## II) Track Mode operation

In Track Mode, output will follow the loading on the sensor as the load on the machine increases and decreases.

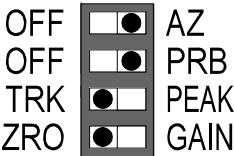


- 1) Set the Mode Select Switches to AZ OFF, PRB OFF, TRK, and ZRO as shown above. If Auto-Zero is not needed, it is done. Skip the following steps.
- 2) If Auto-Zero is needed, then
  - a) Toggle the OFF/AZ switch to AZ to start Auto-Zero.



- b) When Auto-Zero is done, only the 2 yellow LEDs at 0.0V are lit.

3) Set the OFF/PRB switch to PRB.



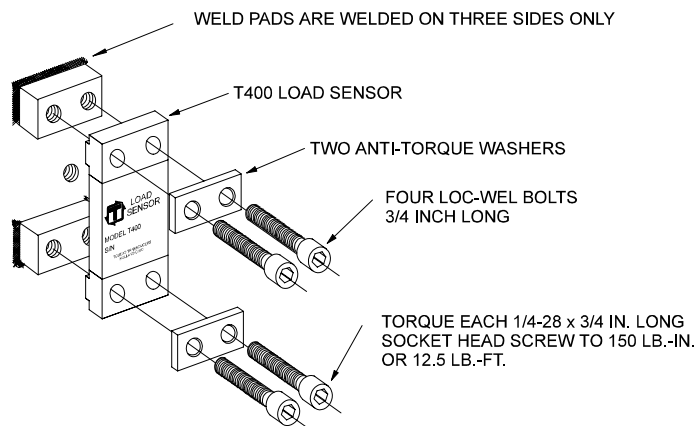
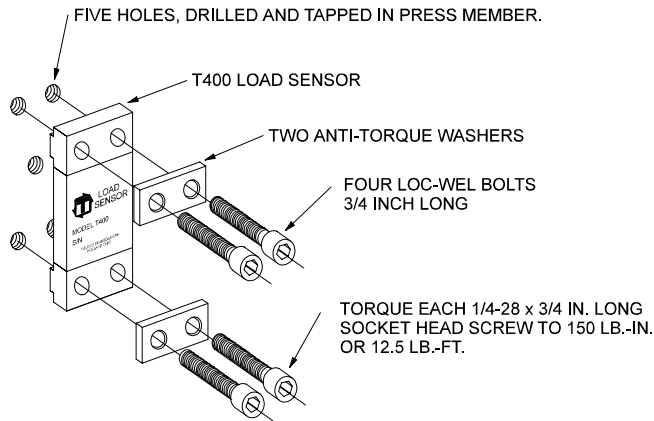
# Appendix

- A) **Sensor Installation (Doc# 11080)**
- B) **Calibration Sheets (2) (Form# 1224)**

**THIS PAGE  
INTENTIONALLY  
LEFT BLANK**



# INSTALLING T400 LOAD SENSORS



The above illustrations represent the proper arrangement of Model T400 Load Sensor kit parts using either the Drill and Tap method or the Weld method.

A proper installation is necessary to produce good results.

Before installing the sensors, please read the appropriate instructions listed below.

Sensor Placement	Page 2
Press Frame	Page 3
Pitman Mount	Page 4
Drill and Tap Method of Installing Sensors	Page 5
Weld Method of Installing Sensors	Page 6
T400 Enclosure Mounting Details	Page 7

**NOTES:**

- 1) (2) SENSORS REQUIRED
- 2) (2) SENSOR ENCLOSURES ARE INCLUDED. THESE HELP PROTECT THE T400 SENSOR GAUGES. THESE ENCLOSURES INCLUDE 1/2" KNOCK-OUT HOLES. IF CONDUIT IS USED, WE SUGGEST USING 1/2" STRAIN RELIEFS IN THE KNOCK-OUT HOLES.

## SENSOR PLACEMENT

Sensor location must be determined. You have two locations. The front or the rear of the press. (Shown in the shaded area.)

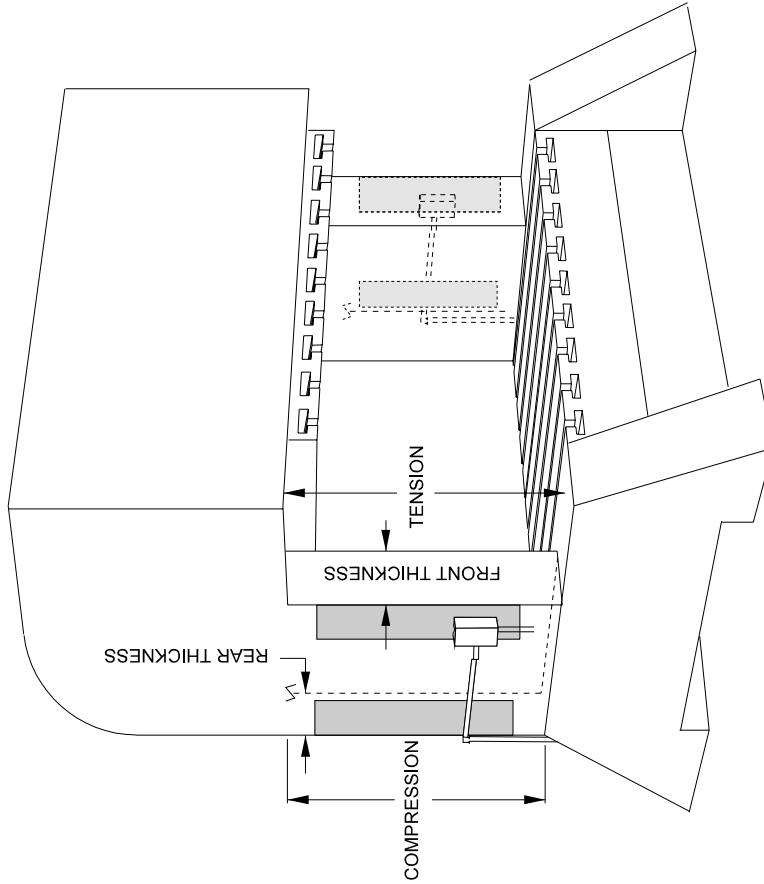
### HOW TO DETERMINE THE BEST LOCATION

\* MEASURE THE REAR THICKNESS \_\_\_\_\_ REAR

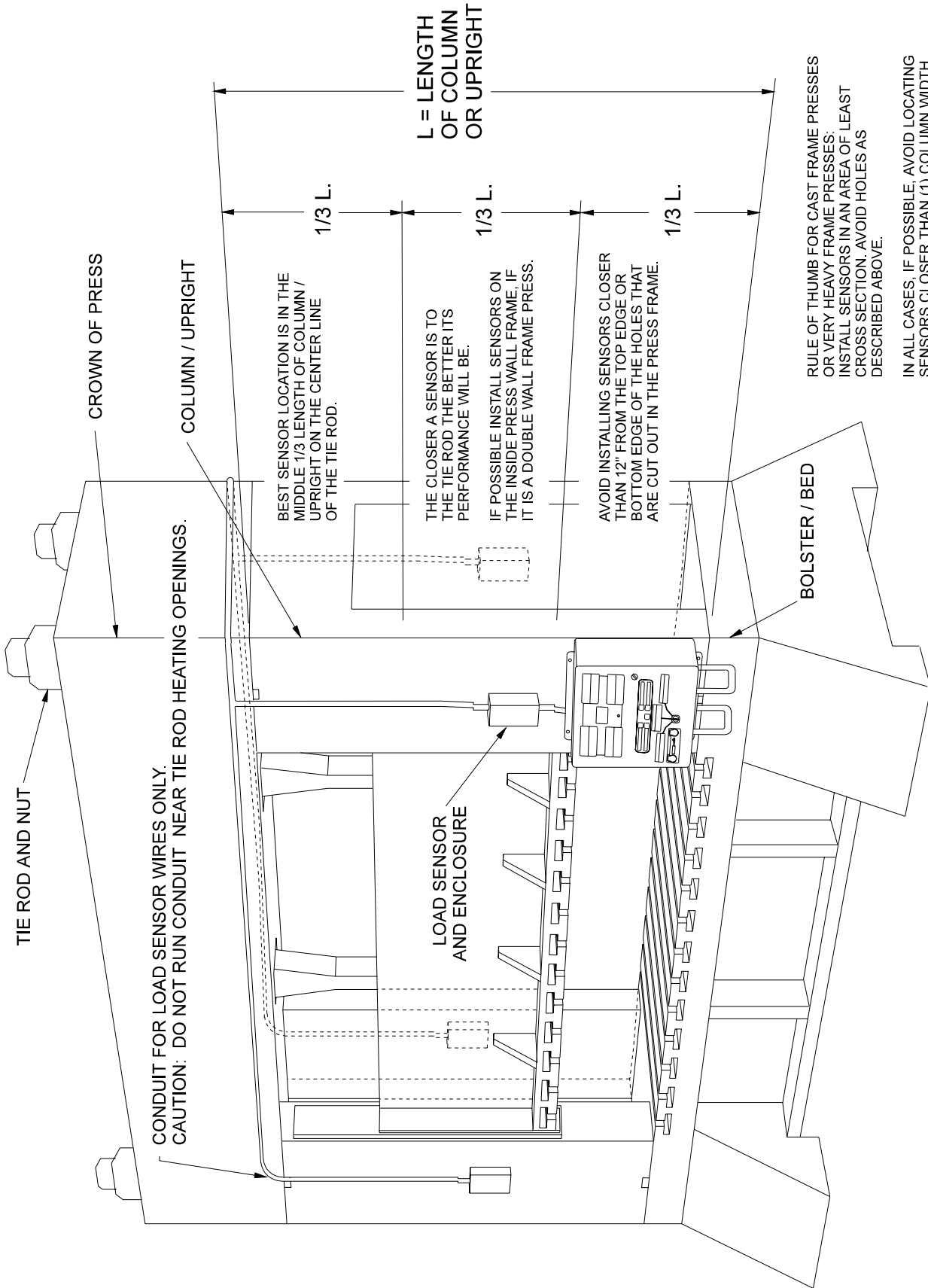
\* MULTIPLY BY THREE X 3 =

\* MEASURE THE FRONT THICKNESS \_\_\_\_\_ FRONT

If the front thickness is smaller than value in , then mount sensors in the front. (This is the most common.)  
If the front thickness is larger, then place the sensor in the rear. Adjust the input connection for compression readings instead of tension.

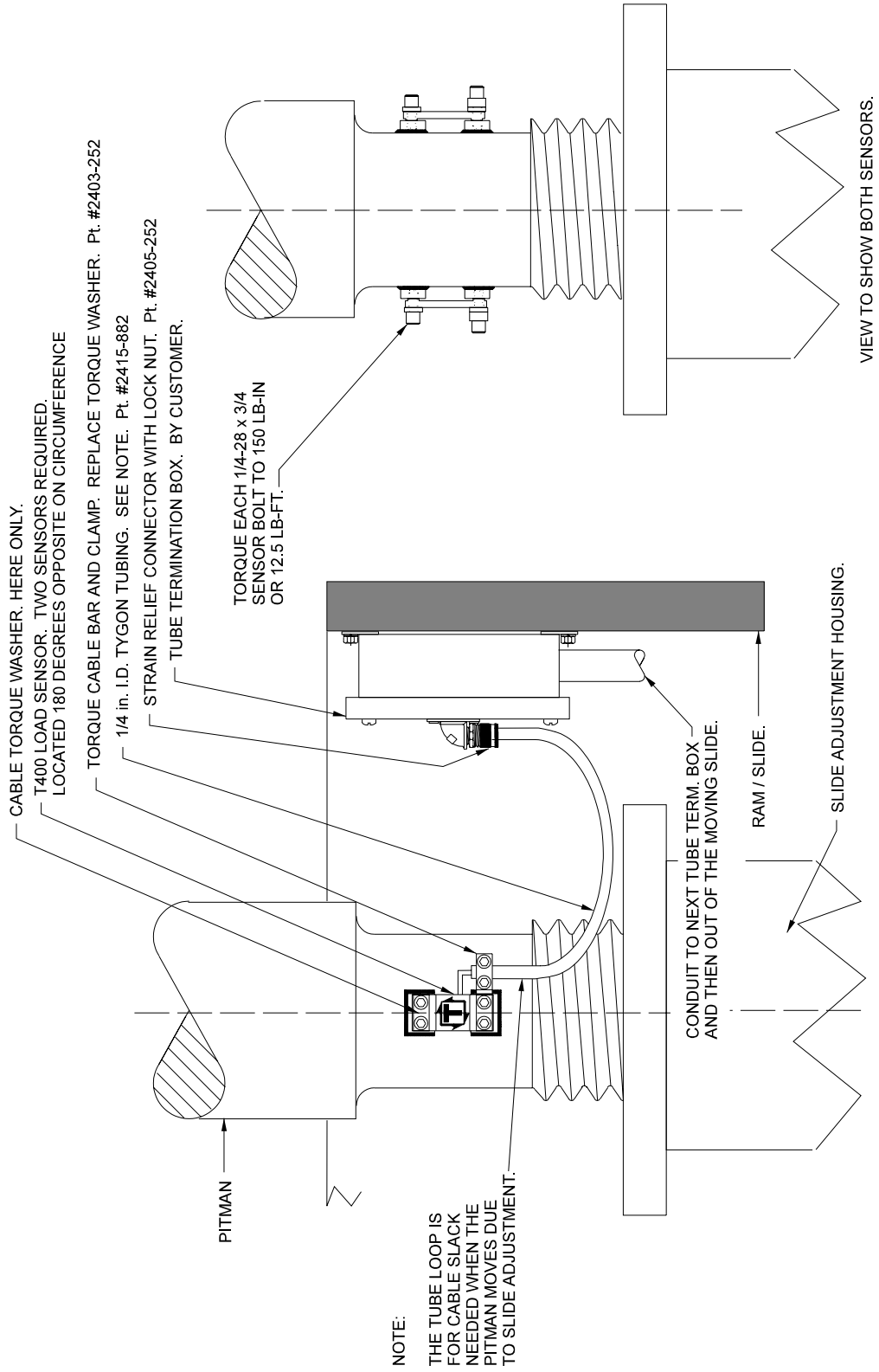






RULE OF THUMB FOR CAST FRAME PRESSES OR VERY HEAVY FRAME PRESSES:  
 INSTALL SENSORS IN AN AREA OF LEAST CROSS SECTION. AVOID HOLES AS DESCRIBED ABOVE.

IN ALL CASES, IF POSSIBLE, AVOID LOCATING SENSORS CLOSER THAN (1) COLUMN WIDTH FROM THE CROWN OR BOLSTER.

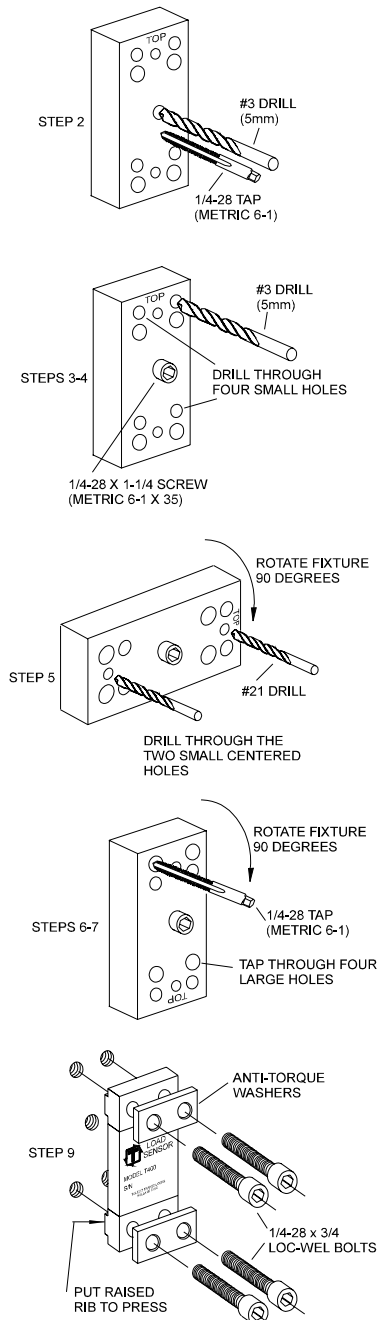


## USING THE T400 SENSOR INSTALLATION FIXTURE KIT No. 1977-749

### (METRIC INSTALLATION FIXTURE KIT No. 1974-749)

#### *DRILL AND TAP METHOD FOR MOUNTING SENSORS*

BE SURE THE SENSOR LOCATION FOLLOWS THE BEST LOCATION DESCRIBED ON THE PREVIOUS PAGES.



STEP 1 Remove all paint and grease from sensor mount area. If the machine surface is flat (total indicated reading of .002”) and smooth (125 μ in.) the load sensor can be bolted directly to the surface.

STEP 2 Drill and tap the center hole for mounting the fixture to the press member. This hole should be ½ inch (13mm) deep.

STEP 3 Bolt the fixture to the press member using the ¼-28 by 1-¼ inch (M6-1 x 35) long socket head cap screw in the center of the fixture.

STEP 4 Insert the number 3 drill (5mm) into the smaller corner hole and drill out all four holes to a depth of ¾ of an inch (19mm.)

STEP 5 Loosen the fixture. Rotate the fixture 90 degrees clockwise. Tighten the center screw of the fixture. Insert the number 21 drill into the small centered hole and drill out both holes to a depth of 3/8 of an inch. These holes are for mounting the sensor enclosure. The fixture does not allow for tapping these holes. They are tapped without the fixture. Enclosure mounting is not done in metric.

STEP 6 Loosen the fixture. Rotate the fixture another 90 degrees clockwise such that the larger corner holes line up with the holes drilled in Step 4. Insert a tap to be sure the holes line up. Lock the fixture in place by tightening the center screw.

STEP 7 Insert the tap into the larger tap guide holes and tap each hole.

BE SURE TO USE PLENTY OF TAPPING FLUID.

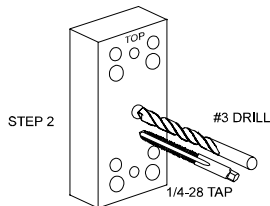
STEP 8 Remove the fixture and repeat Steps 1-7 for each additional sensor mounting position.

STEP 9 Mount the sensor with the raised rib to the press. The anti-torque washers should go between the screw and the sensor body. Torque each ¼-28 x ¾ in. long socket head cap screw to 150 LB.-IN or 12.5 LB.-FT.

# USING THE T400 SENSOR INSTALLATION FIXTURE KIT No. 1977-749

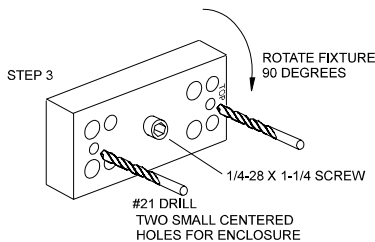
## *WELD PAD METHOD FOR MOUNTING SENSORS*

BE SURE THE SENSOR LOCATION FOLLOWS THE BEST LOCATION DESCRIBED ON THE PREVIOUS PAGES.

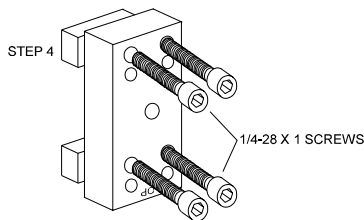


STEP 1 Remove all paint, grease, and or rust from surface to be welded. (Surface should be flat T.I.R. 1/32 of an inch.)

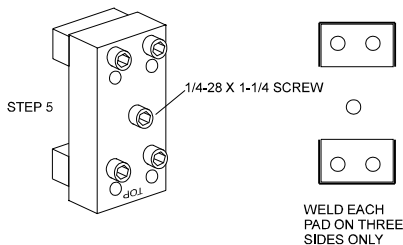
STEP 2 Drill and tap the center hole for mounting the fixture to the press member. This hole should be 1/2 inch deep. (Optional)



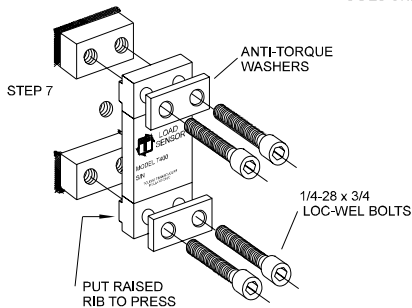
STEP 3 Bolt the fixture to the press member using the 1/4-28 by 1-1/4 inch long socket head cap screw in the center of the fixture. Orient the fixture as shown and drill out the #21 holes to a depth of 3/8 of an inch for the enclosure mounting. The fixture is not used for tapping these holes. (Optional)



STEP 4 Remove the fixture from the press member. Bolt the weld pads to the fixture with 1/4-28 by 1 inch long socket head cap screws provided. Reattach the fixture with the weld pads bolted on using the center hole as in Step 3. Orient the fixture as shown.



STEP 5 Weld the weld pads to the press member. (BE SURE TO ONLY WELD THE WELD PADS ON THREE SIDES AS SHOWN.) A single pass is sufficient. Do not remove the fixture until slag is removed and or assembly has cooled. When welding cast iron, use a dry nickel rod such as: Lincoln Electric "Soft Weld", Hobart "NI Cast 99", or MB Weld Prod. "MG 210. Strike arc on steel then puddle into the cast iron.



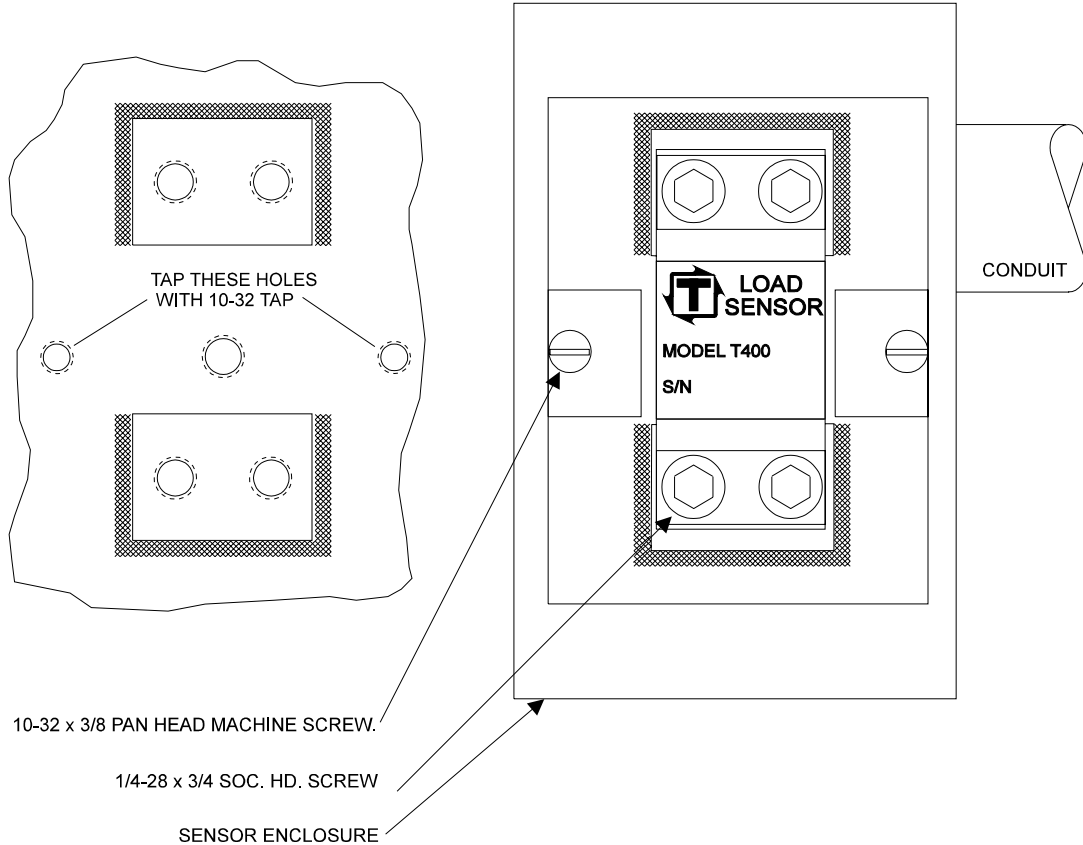
STEP 6 Remove the weld fixture. DO NOT WELD AFTER FIXTURE IS REMOVED. The 4 screws holding the pads to the fixture and the 1 center screw may be discarded. DO NOT USE THE FOUR 1 INCH LONG SCREWS TO ASSEMBLE SENSOR. The sensor kit contains four 3/4 inch long screws for assembling the sensor to the press member. Weld pad surface must be clean – no weld bumps, scratches, etc. Be sure the weld pad tapped holes are clean and bottom of holes are free of weld flash.

STEP 7 Mount the sensor with the raised rib to the press. The anti-torque washers should go between the screw and the sensor body. Torque each 1/4-28 x 3/4 in. long socket head screw to 150 LB.-IN or 12.5 LB.-FT.

# SENSOR ENCLOSURE MOUNTING

USE 10-32 TAP IN THE TWO 3/8" DEEP HOLES THAT WERE DRILLED WITH THE FIXTURE IN THE PREVIOUS INSTRUCTIONS. MOUNT THE ENCLOSURE TO THE PRESS MEMBER AND RUN 1/2" INCH CONDUIT TO THE LOAD MONITOR ENCLOSURE.

RUN SENSOR CABLE THROUGH CONDUIT. PLACE SENSOR ON MOUNTING HOLES. PLACE ANTI-TORQUE WASHERS OVER SENSOR HOLES. SCREW IN SENSORS BOLTS, (4) EACH, FINGER TIGHT. USE ONLY THE 1/4-28 x 3/4" "LOC-WEL" BOLTS THAT ARE IN THE SENSOR PACKAGE. TORQUE EACH 1/4-28 x 3/4" SCREW TO 150 LB.-IN. OR 12.5LB.-FT. ASSEMBLE BOX COVER.





COMPANY: \_\_\_\_\_

DATE: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

PRESS SERIAL No: \_\_\_\_\_

PRESS (Type and & No.): \_\_\_\_\_

CONTACT: \_\_\_\_\_

PRESS CAPACITY: \_\_\_\_\_

PHONE: (\_\_\_\_) \_\_\_\_\_

LOAD MONITOR MODEL: \_\_\_\_\_

SERVICE ORDER #: \_\_\_\_\_

MONITOR SERIAL No. \_\_\_\_\_

SLIDE-ADJUST INDICATOR

TONNAGE APPLIED TO **LOAD CELLS** ON PRESS

TONNAGE DISPLAYED ON **LOAD MONITOR**

\_\_\_\_\_

LR	_____	TOTAL	_____	RR
LF	_____		_____	RF

LR	_____	TOTAL	_____	RR
LF	_____		_____	RF

\_\_\_\_\_

LR	_____	TOTAL	_____	RR
LF	_____		_____	RF

LR	_____	TOTAL	_____	RR
LF	_____		_____	RF

\_\_\_\_\_

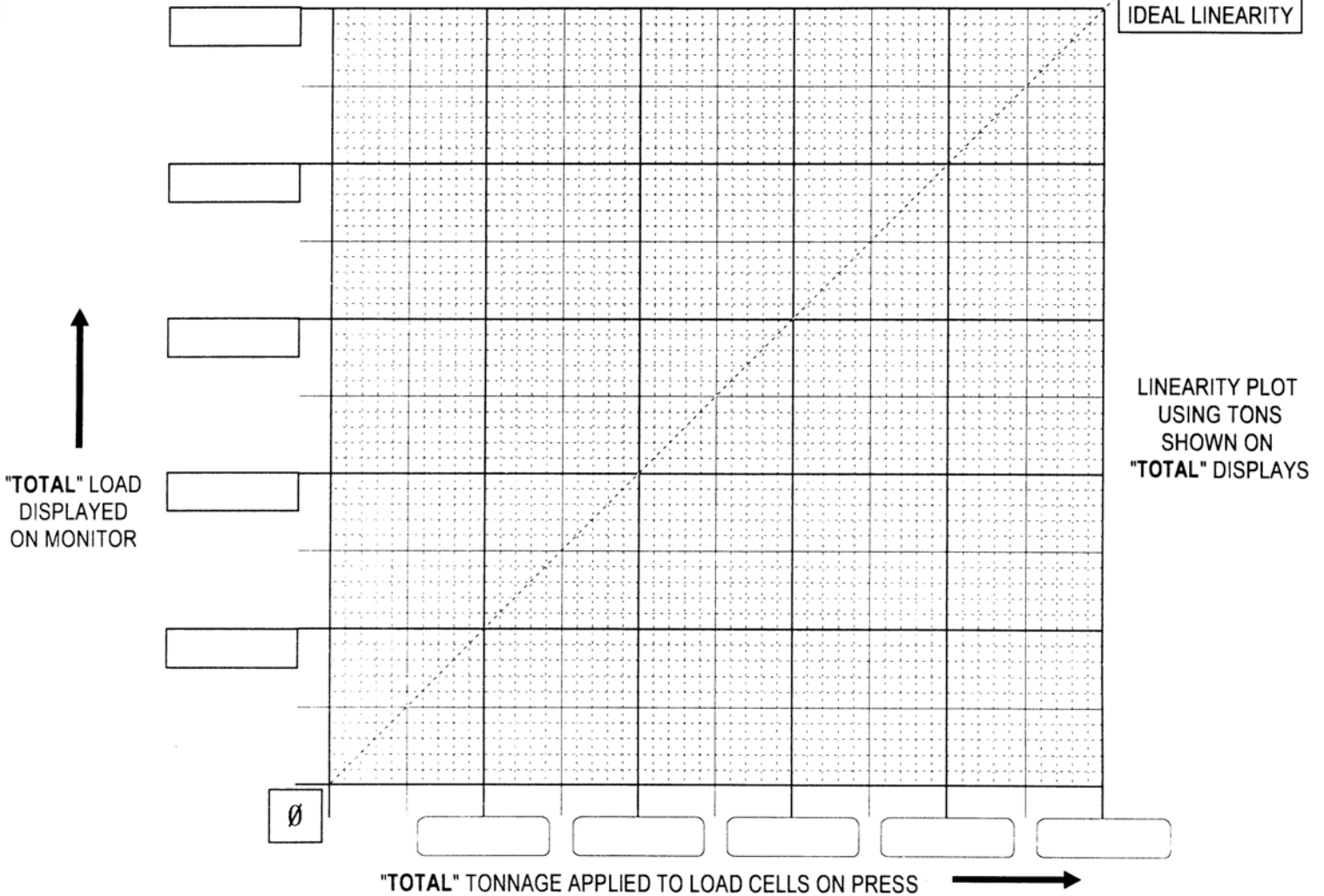
LR	_____	TOTAL	_____	RR
LF	_____		_____	RF

LR	_____	TOTAL	_____	RR
LF	_____		_____	RF

\_\_\_\_\_

LR	_____	TOTAL	_____	RR
LF	_____		_____	RF

LR	_____	TOTAL	_____	RR
LF	_____		_____	RF



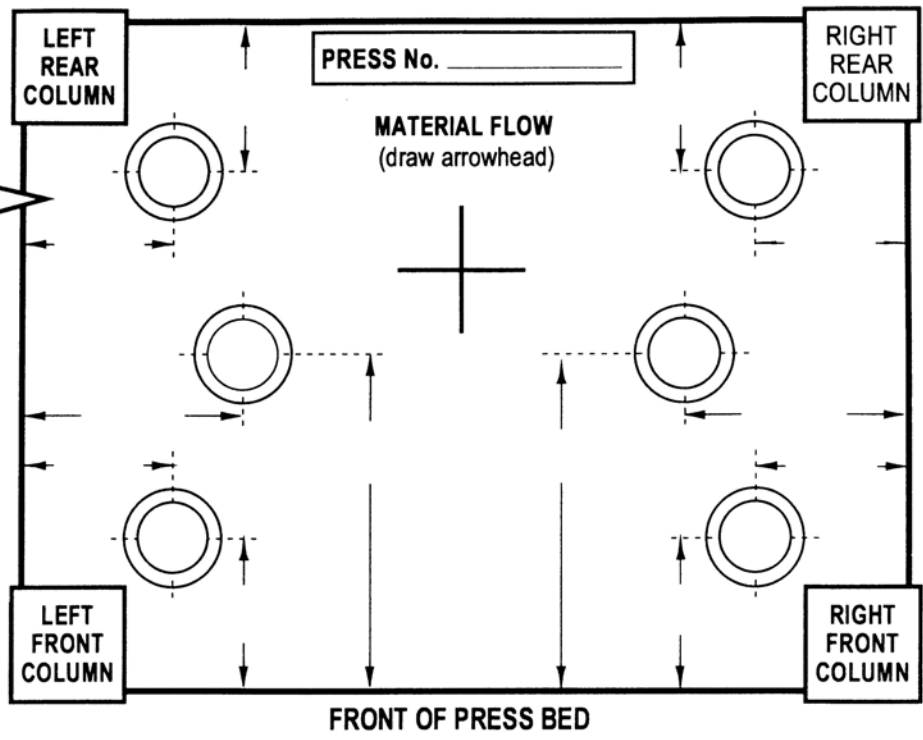
LINEARITY PLOT USING TONS SHOWN ON "TOTAL" DISPLAYS

**DRAW IN :** \_\_\_\_\_

- CHANNEL NUMBER
- SENSOR LOCATION
- MONITOR LOCATION
- LOAD CELL LOCATION
- DIRECTION OF MATL. FLOW

**SHUNT RESISTORS:**  
ONE MEG ? YES \_\_\_ NO \_\_\_

**OTHER RESISTORS:**  
CHAN. 1 \_\_\_\_\_  
CHAN. 2 \_\_\_\_\_  
CHAN. 3 \_\_\_\_\_  
CHAN. 4 \_\_\_\_\_



TYPE OF LOAD CELLS: \_\_\_\_\_ TYPE OF LOAD CELL READOUT: \_\_\_\_\_

**TONNAGE SENSORS**

**CALIBRATION LOAD CELLS**

SENSOR NUMBER	SERIAL NO.	CAL. NO.	X 10	LOCATION (LF, RF, LR, RR)
1				
2				
3				
4				

CELL NUMBER	CAPACITY TONS	SERIAL NO.	CAL. NO.
1			
2			
3			
4			

CCM TYPE: \_\_\_\_\_ CCM OFFSET: \_\_\_\_\_ STI REFERENCE NUMBER: LOW: \_\_\_\_\_ HIGH: \_\_\_\_\_

STI DEGREES IN CHANNEL No. 1: \_\_\_\_\_

TRIGGERED FROM PROBE ? YES \_\_\_ NO \_\_\_ (Show threshold value if not triggered from probe): \_\_\_\_\_

TRIPPED ALARM RELAY STOPS PRESS ? YES \_\_\_ NO \_\_\_ EXPLAIN: \_\_\_\_\_

ALL STICKERS AND DOCUMENTS FILLED OUT ? YES \_\_\_ NO \_\_\_ IF NOT, EXPLAIN WHY: \_\_\_\_\_

TFP No.: HIGH 2 \_\_\_\_\_ LOW 2 \_\_\_\_\_ HIGH 4 \_\_\_\_\_ LOW 4 \_\_\_\_\_ HIGH 6 \_\_\_\_\_ LOW 6 \_\_\_\_\_ HIGH 8 \_\_\_\_\_ LOW 8 \_\_\_\_\_

COMMENTS: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

TESTS MADE BY: \_\_\_\_\_ TESTS ACCEPTED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

**MAIL ADDRESS:**  
TOLEDO TRANSDUCERS, INC.  
P.O. BOX 10  
HOLLAND, OHIO 43528

**SHIPPING ADDRESS:**  
TOLEDO TRANSDUCERS, INC.  
6834 SPRING VALLEY DR.  
HOLLAND, OHIO 43528

**PHONE:** 1 (419) 867-4170  
**FAX:** 1 (419) 867-4180



COMPANY: \_\_\_\_\_

DATE: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

PRESS SERIAL No: \_\_\_\_\_

PRESS (Type and & No.): \_\_\_\_\_

CONTACT: \_\_\_\_\_

PRESS CAPACITY: \_\_\_\_\_

PHONE: (\_\_\_\_) \_\_\_\_\_

LOAD MONITOR MODEL: \_\_\_\_\_

SERVICE ORDER #: \_\_\_\_\_

MONITOR SERIAL No. \_\_\_\_\_

SLIDE-ADJUST INDICATOR

TONNAGE APPLIED TO **LOAD CELLS** ON PRESS

TONNAGE DISPLAYED ON **LOAD MONITOR**

LR	<input type="text"/>	TOTAL	<input type="text"/>	RR
LF	<input type="text"/>		<input type="text"/>	RF

LR	<input type="text"/>	TOTAL	<input type="text"/>	RR
LF	<input type="text"/>		<input type="text"/>	RF

LR	<input type="text"/>	TOTAL	<input type="text"/>	RR
LF	<input type="text"/>		<input type="text"/>	RF

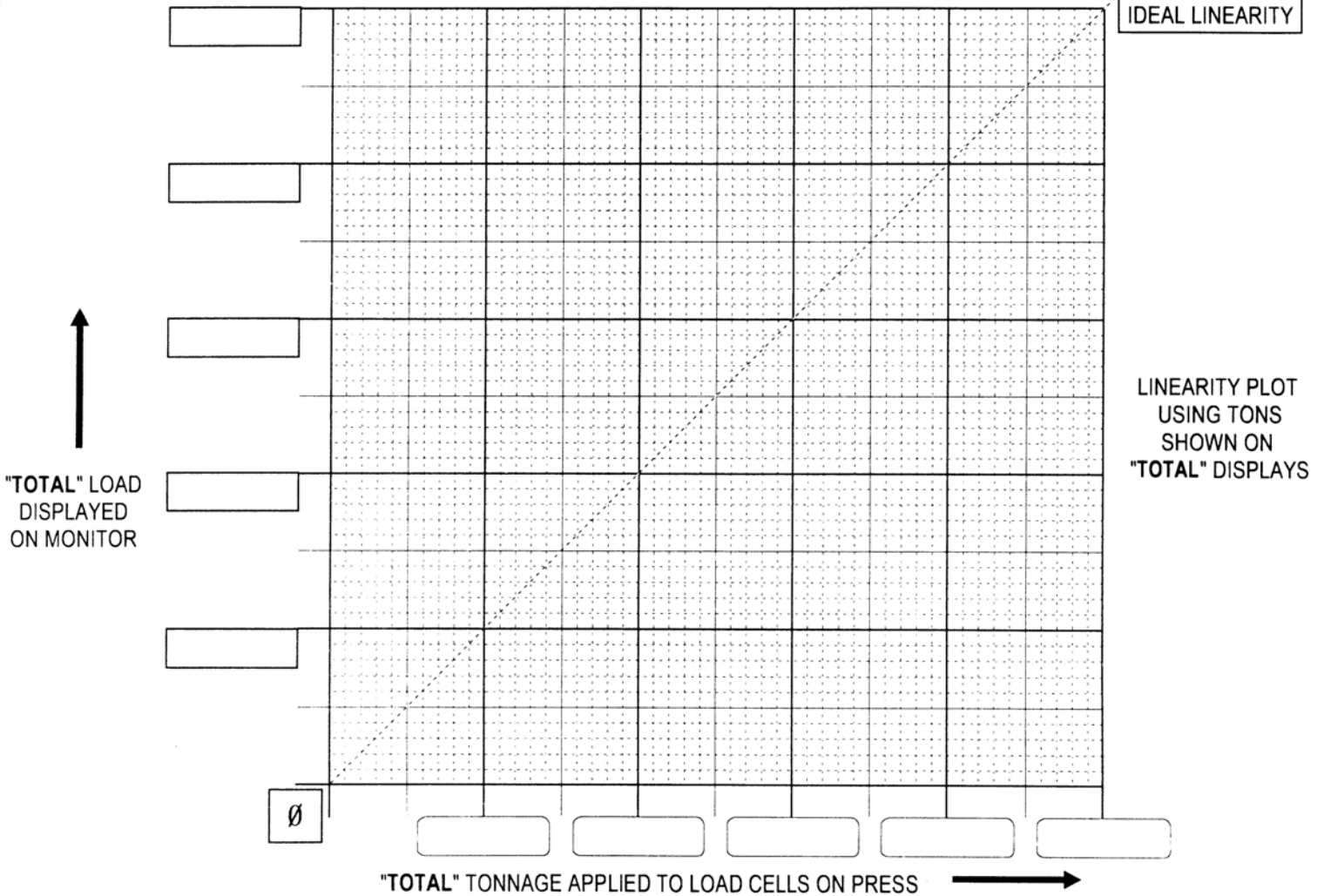
LR	<input type="text"/>	TOTAL	<input type="text"/>	RR
LF	<input type="text"/>		<input type="text"/>	RF

LR	<input type="text"/>	TOTAL	<input type="text"/>	RR
LF	<input type="text"/>		<input type="text"/>	RF

LR	<input type="text"/>	TOTAL	<input type="text"/>	RR
LF	<input type="text"/>		<input type="text"/>	RF

LR	<input type="text"/>	TOTAL	<input type="text"/>	RR
LF	<input type="text"/>		<input type="text"/>	RF

LR	<input type="text"/>	TOTAL	<input type="text"/>	RR
LF	<input type="text"/>		<input type="text"/>	RF



**DRAW IN :** \_\_\_\_\_

- CHANNEL NUMBER
- SENSOR LOCATION
- MONITOR LOCATION
- LOAD CELL LOCATION
- DIRECTION OF MATL. FLOW

**SHUNT RESISTORS:**  
ONE MEG ? YES \_\_\_ NO \_\_\_

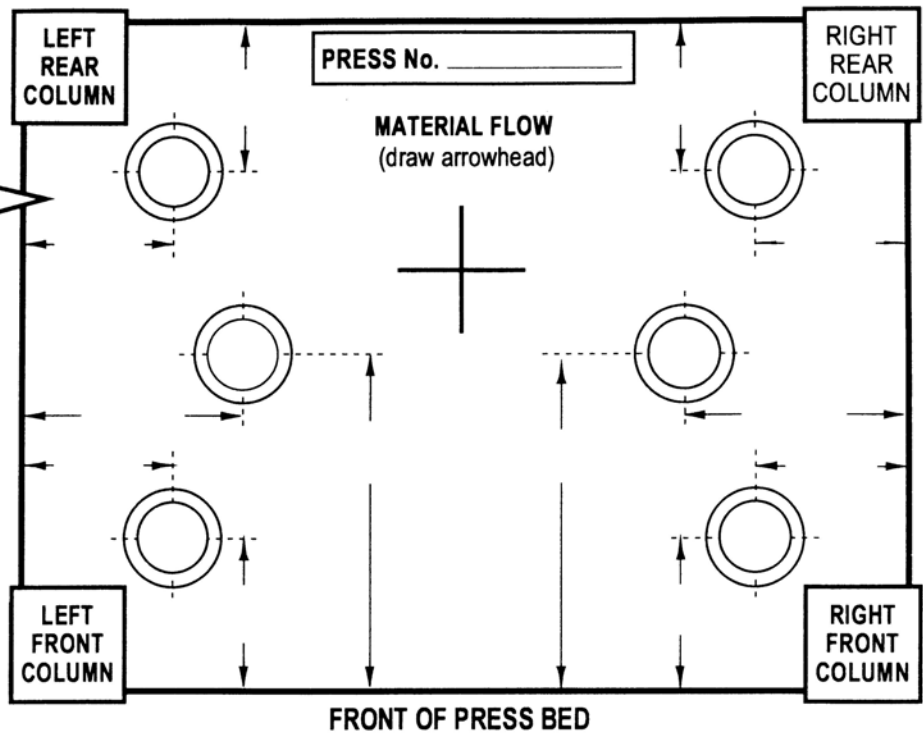
**OTHER RESISTORS:**

CHAN. 1 \_\_\_\_\_

CHAN. 2 \_\_\_\_\_

CHAN. 3 \_\_\_\_\_

CHAN. 4 \_\_\_\_\_



TYPE OF LOAD CELLS: \_\_\_\_\_ TYPE OF LOAD CELL READOUT: \_\_\_\_\_

**TONNAGE SENSORS**

**CALIBRATION LOAD CELLS**

SENSOR NUMBER	SERIAL NO.	CAL. NO.	X 10	LOCATION (LF, RF, LR, RR)
1				
2				
3				
4				

CELL NUMBER	CAPACITY TONS	SERIAL NO.	CAL. NO.
1			
2			
3			
4			

CCM TYPE: \_\_\_\_\_ CCM OFFSET: \_\_\_\_\_ STI REFERENCE NUMBER: LOW: \_\_\_\_\_ HIGH: \_\_\_\_\_

STI DEGREES IN CHANNEL No. 1: \_\_\_\_\_

TRIGGERED FROM PROBE ? YES \_\_\_ NO \_\_\_ (Show threshold value if not triggered from probe): \_\_\_\_\_

TRIPPED ALARM RELAY STOPS PRESS ? YES \_\_\_ NO \_\_\_ EXPLAIN: \_\_\_\_\_

ALL STICKERS AND DOCUMENTS FILLED OUT ? YES \_\_\_ NO \_\_\_ IF NOT, EXPLAIN WHY: \_\_\_\_\_

TFP No.: HIGH 2 \_\_\_\_\_ LOW 2 \_\_\_\_\_ HIGH 4 \_\_\_\_\_ LOW 4 \_\_\_\_\_ HIGH 6 \_\_\_\_\_ LOW 6 \_\_\_\_\_ HIGH 8 \_\_\_\_\_ LOW 8 \_\_\_\_\_

COMMENTS: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

TESTS MADE BY: \_\_\_\_\_ TESTS ACCEPTED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

**MAIL ADDRESS:**  
TOLEDO TRANSDUCERS, INC.  
P.O. BOX 10  
HOLLAND, OHIO 43528

**SHIPPING ADDRESS:**  
TOLEDO TRANSDUCERS, INC.  
6834 SPRING VALLEY DR.  
HOLLAND, OHIO 43528

**PHONE:** 1 (419) 867-4170  
**FAX:** 1 (419) 867-4180