280

WITH MODELS
2086
2186
2886
AND
280
CONVERSION

Technical Manual
and
Parts Catalog

INTRODUCTION

This publication is provided solely as a guide for individuals who have received METTLER TOLEDO Technical Training in servicing the METTLER TOLEDO product.

Information regarding METTLER TOLEDO Technical Training may be obtained by writing to:

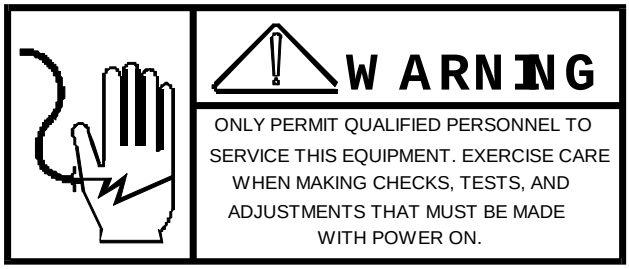
METTLER TOLEDO
Training Center
P.O. Box 1705
Columbus, Ohio 43216
(614) 438-4400

PRECAUTIONS

- **READ** this manual before operating or servicing this equipment.

- **ALWAYS REMOVE POWER** and wait at least 30 seconds **BEFORE** connecting or disconnecting any internal harnesses. Failure to observe these precautions may result in damage to, or destruction of the equipment.

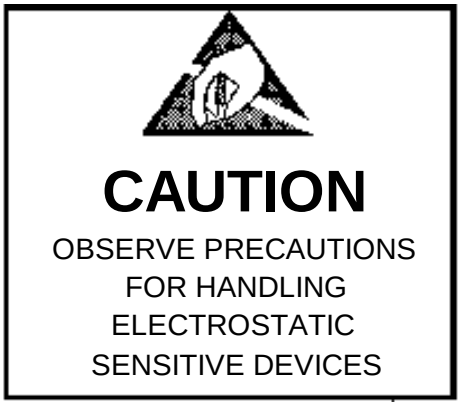
- **ALWAYS** take proper precautions when handling static sensitive devices.



- **DO NOT** connect or disconnect a load cell scale base to the equipment with power connected or damage will result.

- **SAVE** this manual for future reference.

- **DO NOT** allow untrained personnel to operate, clean, inspect, maintain, service, or tamper with this equipment.



- **ALWAYS DISCONNECT** this equipment from the power source before servicing.

- **CALL** METTLER TOLEDO for parts, information, and service.

1. GENERAL DESCRIPTION

The electronic digital indicator is designed for industrial use with a low or medium capacity load cell which is part of the instrument (indicator) connected to mechanical understructures through a load bearing steelyard. A keyboard on the front of the instrument provides the following functions: (See section 2 functional description for details p4).

1. Zero the weight indication
2. Clear - clears entered tare
3. Automatic tare (an optional manual tare module is available)
4. LB or Kg selection
5. Print for printing weight information on optional printer utilizing a 20 ma current loop.

1.1 PHYSICAL CHARACTERISTICS

Scale electronics, including the general purpose (GP) load cell, are housed in a NEMA 4 enclosure. The display is visible through a plastic window, and pushbutton actuators are sealed via "O" rings. Power enters the enclosure via a line cord which is inside the support tube, and exits near the scale base.

1.2 SPECIFICATIONS

A. CAPACITY

Two internal switches select capacities of 1500, 2000, 2500, and 3000 increments.

B. INCREMENT

Two internal switches select increments of x1, x2, and x5.

C. DECIMAL POINT

Three internal switches select decimal point locations as follows:

XXXX0
XXXXX
XXXX.X
XXX.XX
XX.XXX
X.XXXX

D. INITIAL AND SPAN

Internal switches and potentiometers provide initial compensation of from 0 to 16.5 millivolts and span adjustment of from 4 to 16 microvolts per increment. Either 1.5 MV/V (GP-2) or 2.0 M/V (GP-1) cells may be used.

E. LOAD CELL EXCITATION

Excitation is provided for one 240 ohm load cell.

F. DISPLAY

Five digits, LED, 0.5" high, with self contained decimal point. Lighted LED's adjacent to legends for ZERO, NET, LB, kg.

G. OVERCAPACITY

Gross weights which exceed the selected capacity of the scale by more than five increments will cause blanking of the Weight display. Expand mode inhibits blanking. This may be used for such things as setting the load cell overload stop.

H. WEIGHT IN MOTION

The system includes “weight in motion" detection in order to inhibit the Zero, Tare, or Print functions while the weight display is changing.

No motion is defined as 3 successive weight readings within ± minor weight increments.

I. TEMPERATURE SPECIFICATIONS

Operating Range: -10 to +50°C

J. POWER

1). Power Supply

The scale is intended for operation at: 102-132 volts, 50 or 60 hz. Power consumption is about 20 watts.

2). Power Interruption

When power is turned on or when restored after more than a 1 second interruption, the Zero Indicator will flash until the Zero pushbutton is pressed or until zero is automatically captured.

K. DATA OUTPUT

Data output is provided in bit serial form, ASCII Code, 300 baud, 20 ma current loop, even parity, for use with a Victor, Datel, or similar printer. The 20 ma current is provided by the instrument and the signal is not isolated from ground at the scale end. The signal should be isolated at the printer end.

2. DESCRIPTION OF FUNCTIONS

A. PUSHBUTTONS

Front panel mounted pushbuttons are provided as follows (left to right)

L to R	Function
Z	Rezero the scale
C	Clear Tare
TR	Enter Tare
LB/kg	Select LB or kg, alternate action
P	Print

B. INSTRUMENT ZEROING

1). Automatic Zero Maintenance

The scale is equipped with automatic zero maintenance (AZM) which operates by subdividing the zero increment into ten minor increments and determining whether the zero signal is within the center minor increment. If it is not, but is within the major zero increment, a minor increment is added to or subtracted from the signal to cause the displayed weight to be nearer the center minor increment. The range of zero maintenance is limited to 4% of scale capacity with the center of the range determined by the internal analog zero setting. Weight variations which occur at a rate of 0.2 increments per second or slower will be compensated. AZM is inhibited in expand mode (SW3-5,6,7, off).

2). Pushbutton Zero

A front panel pushbutton provides rezeroing of the scale over a range of 4% of scale capacity. The center of this range is determined by the setting of the analog zero potentiometer. The Zero pushbutton must be held depressed while there is "no motion", with the scale in the Gross weighing mode, to be effective. Pushbutton zero operates by determining the difference between the actual weight and zero, to the nearest minor increment, and adding or subtracting this value to the actual weight to provide a corrected weight of display.

3). Zero Indication

An LED adjacent to the legend ZERO will be illuminated when the instrument zero is within ±0.25 increments of the center of the zero increment. A blinking ZERO LED indicates zero is not captured.

4). Display Verification -- Visual

Pressing the ZERO pushbutton causes the center segment of each of the 5 LED digital displays and all legends to turn on. When the button is released and the scale is empty, all zeroes will be displayed. A combination of these tow displays demonstrates that all segments and drive circuits are functional in both ON and OFF conditions.

C. CLEAR

Pushing the clear pushbutton will clear out any tare entered and return the display to a zero indication. This is the only function of the switch.

D. TARE

1). Pushbutton Tare - Normal Mode

Tare may be entered by pressing the TARE button whenever the Gross or Net weight is positive and there is no motion. Tare is limited to a maximum of four significant digits. If the Tare weight is removed, the display shows (-) Net Weight. Tare is cleared by use of the C pushbutton.

2). Pushbutton Tare - Interlocked Mode

When the internal tare interlock switch is ON, Tare may be entered by pressing the TARE button only when the scale is in the Gross Weight mode, the Gross Weight is positive, and there is no motion. Tare is limited to a maximum of four significant digits. The Zero pushbutton is not operative after a Tare has been taken, i.e. in the Net mode. Tare must be cleared by use of the C pushbutton before a new Tare may be entered.

3). Digital Tare (Option)

Provision is included for entry of tare via four selector switches which are mounted in an enclosure attached to the scale column. Whenever the switches are set to other than 0000, the scale is in the NET mode, and pushbutton Tare and LB-KG switching is not operative.

When the scale increment is selected as x2 or x5, the least significant digit of tare will be rounded off as follows:

Tare Switch LSD*	**Tare Entered (x2)**	**Tare Entered (x5)**
0	0	0
1	2	0
2	2	0
3	4	5
4	4	5
5	6	5
6	6	5
7	8	5
8	8	10
9	10	10

Switch tare is cleared by returning the switches to the 0000 position. The clear button has no effect upon Manual Switch tare.

*LSD = Least Significant Digit

E. LB/KG SELECTION

For Avoidupois models, a front panel LB/kg pushbutton is provided. When power is first applied to the unit , the LB mode is selected and the LB indicator is turned ON. Pressing the LB/kg button selects the kg mode and turns on the kg indicator. Pressing the button again restores the LB mode, etc. alternately.

The increment in the kg mode is related to the LB mode increment as follows:

LB	**kg**
0.1	0.05
0.2	0.1
0.5	0.2
1	0.5
2	1
5	2
etc	etc

Note that the correct decimal point and increment are automatically selected when switching modes. Note that the total number of increments is always the same for both LB and kg modes, as selected by the capacity switches. A program switch (SW-4-3) is provided to select power up in the kg mode.

F. PRINT (OPTION)

Internal program switches select printing formats in accordance with the following examples:

1). Gross or Net only, as displayed
12.345LB (gross)
or 12.345LB Net

2). Gross, Tare Net on a signal line, by a single PRINT initiation.
12.345LB 0.345LBTR 10.000LB NET

Negative Gross weights are always inhibited from printing. Negative Net weights may or may not be Tare weights, and are printed with a preceding minus sign.

The data is transmitted only once when the Print button is pressed. If the weight is in motion when the button is pressed, the Print Command will be stored until motion ceases, and then the data will be transmitted.

Expanded data printing. In 5-1 the weight information may be selected by program switches as a single or double width print. 5-2 is always sent single width.

3. TECHNICAL AND SERVICE DATA

3.1 THEORY OF OPERATION

This PCB provides the following functions:

A. POWER SUPPLY
+ 5 Volt Logic
± 15 Volt Logic and
Load Cell Excitation:
+ EXC=+15V
-EXC= Ground Potential

B. PREAMP WITH INITIAL AND SPAN COMPENSATION

C A/D CONVERSION

D. MICROPROCESSOR FUNCTIONS WHICH INCLUDE:

1). A/D Conversion Logic Control
2). Motion Detection
3). Automatic Zero Maintenance
4). Over Capacity Detection
5). LB/kg Selection
6). Pushbutton Zero
7). Data Output (20 ma current loop)

The pre-amp section includes a differential amp. This amp has high attenuation for high frequency transients. Others along with their resistor networks are for initial and span compensation respectively, and also serves as an analog filter.

Analog to digital conversion is accomplished by using the dual slope technique which is controlled by the microprocessor which contains its own 2K rom for program storage . It communicates through 4 separate 8 bit I/O ports.

3.2 POWER SUPPLY

The PCB contains circuits furnishing +5, +15 and -15 volt DC regulated supplies. Raw AC voltage is supplied to the PCB via PJ4 from the transformer assembly. Table below itemizes the AC voltages:

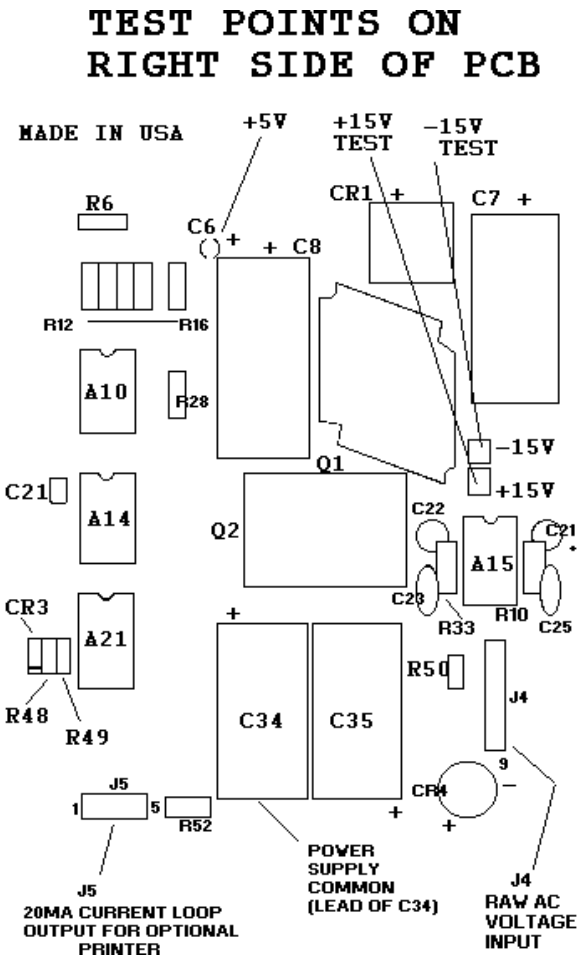
CONNECTION	NOMINAL VOLTAGE	USE
PJ4-6 PJ4-7	17.8 VAC	+15 Volt Supply
PJ4-9 PJ4-7	17.8 VAC	-15 Volt Supply
PJ4-1 PJ4-4	10 VAC	+5 Volt Supply

NOTE: PJ4-7 is grounded centertap

The DC voltage specifications are as follows:

DC SUPPLY	VOLTAGE TOLERANCE	ALLOWABLE RIPPLE(AC)	TEST POINT
+5V	±.25V DC	.01V PP	+side of C^6
+15V	± .5V DC	.001VOLTS PP	+15V shorting pins
-15V	±.5V DC	.001VOLTS PP	-15V shorting pins

NOTE: THE PCB IS NOT GROUNDED TO THE CHASSIS. TO MEASURE THE ABOVE VOLTAGES USE THE POWER SUPPLY COMMON WHICH IS EASILY ACCESSIBLE ON THE BOTTOM LEAD OF C34.



3.3 PROGRAMMING

The PCB has 4 sets of programming switches. SW1 and SW2 are used for coarse adjustment of initial and span respectively. SW 3 is for selecting increment size, number of increments, and decimal point location. SW4 is for selecting various options The following tables itemize each program switch function..

The resistors are switched into the appropriate circuit when the **switch is turned to on.**

SW1 INITIAL - CALIBRATION	SW2 SPAN CALIBRATION
SW1-1 10K Ohm (greatest initial change)	SW2-1 64K Ohm (least span change)
SW1-2 20K Ohm	SW2-2 32K Ohm
SW1-3 40K Ohm	SW2-3 16K Ohm
SW1-4 80K Ohm	SW2-4 8K Ohm
SW1-5 160K Ohm (least initial change)	SW2-5 4K Ohm (greatest span change)

SW3 PROGRAM

Increment size:

SW3-1	SW3-2	Avoir	Metric
Off	Off	x1	x0.5
On	Off	x2	x1
Off	On	x5	x2

Number of full scale increments:

SW3-3	SW3-4	Increments
Off	Off	1.5K
On	Off	2.0K
Off	On	2.5K
On	On	3.0K

Decimal point selection:

SW3-5	SW3-6	SW3-7	Avoir & Metric (x1, x2)	Metric (x5)
On	Off	Off	XXXX0	XXXXX
Off	On	Off	XXXXX	XXXX.X
On	On	Off	XXXX.X	XXX.XX
Off	Off	On	XXX.XX	XX.XXX
On	Off	On	XX.XXX	X.XXXX
Off	On	On	X.XXXX	XXXXX
Off	Off	Off	Expand*	Expand*

*Expand Mode (SW3-5, 6&7 Off)

Expand mode multiplies the number of displayed increments (digital counts) by 5.

SW4 Program

Switch	Function	Description
SW4-1	Tare Interlock	When On Tare is entered only when scale is in Gross Weight mode. Gross Weight is positive, and there is no motion.
SW4-2	VERIFY INHIBIT	THIS MUST BE ON FOR DOMESTIC BUILDS.
SW4-3	Power up Metric	When On scale will power up in metric mode.
SW4-4	Print Option 1	See table below.
SW4-5	Print Option 2	

Print Options

SW4-4	SW4-5	Function
Off	Off	Tare 1 line
Off	On	Tare mullt line (Nof for use with Victor Printer)
On	Off	Displ. single width
On	On	Displ. double width

SW3 Programming By Scale Builds

RAM#	Avoir Cap	Metric Cap	Lever Ratio	LC Cap	Full Scale Incre-ments	Program SW-3 1	2	3	4	5	6	7	Max.Back Weight on Platform
2086													
0001\ 0002	60 x .02	30 x .01	4	25	3K	On	Off	On	On	Off	Off	On	12 LB
0003\ 0004	150 x	60 x .02	4	50	3K	Off	On	On	On	Off	Off	On	ø
0005\ 0006	.05	150 x	4	100	3K	Off	Off	On	On	On	On	Off	50 LB
	300 x .01	.05		(Expand	Mode *)	X	X	X	X	Off	Off	Off	
2186													
0001-0006	150 x .1	75 x .05	8	50	1.5K	Off	Off	Off	Off	On	On	Off	ø
0007-0012	400 x .2	200 x .1	8	100	2.0K	On	Off	On	Off	On	On	Off	184 LB
0013-0018	1250 x	500 x .2	16	100	2.5K	Off	On	Off	On	On	On	Off	14 LB
0019-0024	.5	1250 x	16	200	2.5K	Off	Off	Off	On	Off	On	Off	364 LB
	2500 x 1	.5		(Expand	Mode *)	X	X	X	X	Off	Off	Off	
2886													
0001-0004	1000 x	400 x .2	16	100	2.5K	Off	On	On	Off	On	On	Off	152 LB
0005-0008	.5	1250 x	16	200	2.5K	Off	Off	Off	On	Off	On	Off	252 LB
	2500 x 1	.5		(Expand	Mode *)	X	X	X	X	Off	Off	Off	

NOTES:

1). Odd Ram # have carbon steel pivots and bearings. Even RAM # have stainless steel pivots and bearings.
2). "X" in program SW3 columns means switch position could be on or off.
3). When in expand mode automatic zero maintenance is defeated, along with overcapacity blanking.

* Expand mode displays a number equal to 5 times the number of digital increments that represents the weight of the object on the platform.

CAUTION:
IT IS POSSIBLE TO INADVERTENTLY CHANGE A PROGRAM SWITCH WHILE REMOVING THE COVER. THIS CAN HAPPEN BY A PUSHBUTTON SWITCH PLUNGER ON THE COVER HITTING A PROGRAM SWITCH WHILE LIFTING THE COVER UP TO REMOVE IT. -- BE CAREFUL.

When in expanded mode, the number of digital increments that represent the weight of the object is multiplied by 5.

To compute what the actual display will be, the following formula may be used:

Expanded Mode Indication Formulation

W = Avoirdupois or metric test weight load divided by digital indicator increment value
C = Constant -x5
E = Expanded mode indication
E = WxC

Examples

Digital scale indication = 150LB x 0.1LB	Digital scale indication = 2500LB x 1LB	Digital scale indication = 1250 kg x 0.5kg
Test weight load = 75LB	Test weight load = 1250 LB	Test weight load = 625kg
Increment Value - 0.1LB	Increment Value = 1	Increment Value = 0.5
W= 75¸0.1 = 750	W = 1250 ¸ 1 = 1250	W = 625 ¸.5 = 1250
E =750 x 5 = 3750	E = 1250 x 5 = 6250	E = 1250 x5 = 6250

As an example see table below for expanded mode indication for 1 LB test weight.

MODEL	CAPACITY	ACTUAL WEIGHT	EXPANDED INDICATION	WEIGHT FOR OVERLOAD STOP
2086	60 x .02	1 LB	250	79 LB
	150 x .05	1 LB	100	165 LB
	300 x .1	1 LB	50	385 LB
2186	150 x .1	1 LB	50	202 LB
	400 x .2	1 LB	25	642 LB
	1250 x.5	1 LB	10	1319 LB
	2500 x.1	1 LB	5	3027 LB
2886	1000 x .5	1 LB	10	1265 LB
	2500 x .1	1 LB	5	3027 LB

Examples of Expanded Mode

3.4 CALIBRATION

The Toledo Model 2086, 2186, and 2866 Digital Scales with or without wheels are factory assembled, calibrated, and shipped as one integral unit.

Actual weight and/or expanded mode indications can be used for scale calibration.

Actual Weight Indication Indicates the true applied test weight load. This standard mode of indication is useful in checking the scale calibration.

Expanded Mode Indication
Indicates the total number of increments for the applied test weight load. See Expanded Mode Formulation, page 8. This method is used:

1. For factory original equipment calibration.
2. To refine, if required, the field calibration of existing units.
3. For calibration of scales converted in the field to Digital Indication - adaptation of digital indicator/ load cell arrangement to existing base and platform assembly.
4. For setting the Load Cell Overload Protection Stop Adjustment.

NOTE:
CHANGING INDICATION, INSTABILITY, OR CAUSE OF MECHANICAL FRICTION MUST BE CORRECTED BEFORE PROCEEDING WITH SCALE CALIBRATION

ALWAYS CALIBRATE THE SCALE USING THE MAXIMUM AVAILABLE TEST WEIGHT LOAD ON THE WEIGHT PLATFORM

ALLOW THE LOAD CELL DIGITAL INDICATOR SYSTEM TO WARM UP FOR A MINIMUM PERIOD OF THIRTY (30) MINUTES

THE TEST WEIGHT LOAD MUST WEIGH WITHIN THE SPECIFIED NATIONAL BUREAU OF STANDARDS HANDBOOK 44 DIGITAL SCALE ACCURACY REQUIREMENTS

NOTE:
Scales are factory calibrated before being shipped. However, calibration must be checked during the installation process.

The following procedure is used when complete calibration is needed: when a load cell has been changed for example or conversion.

A. PRELIMINARY PROCEDURE:

1). Ensure instrument has warmed up before attempting calibration and instrument is programmed for the desired configuration.

2). Turn initial and span pots until they are mechanically in mid-range (Pots are 15 turns for full range). Turn all sections of SW2 (Span adjust) to off.

3). Adjusts switch 1 to get display as close as possible to zero or just behind zero. do not adjust initial pot yet.

Use the following technique to minimize interaction of span and initial:

B. FIND INITIAL OFFSET POINT WITH MINIMUM INTERACTION OF SPAN & INITIAL:

1). Move SW2-5 (Greatest span change) to on. Note change in displayed reading. Turn SW2-5 back off.

2). Turn initial pot to change displayed reading by at least 3 increments. Turn SW2- back on and note displayed reading - if displayed reading change is less than that found in Step 1 then direction of pot travel is correct. If not, turn pot in opposite direction then recheck. Continue turning initial pot until finding a spot where turning on SW2-5 does not change displayed indication. You have now located the offset point where span does not effect initial. (This value will usually be a negative indication).

C. PLACE TEST WEIGHT ON PLATFORM OF AT LEAST A 100 INCREMENTS.
Adjust SW2-5 and span pot for an indication of the test weight plus the reading of the offset found in Step 2 is -1.4 (negative 1.4) and test weight is 50.0 lbs. adjust span for 48.6)

D. REMOVE TEST WEIGHT AND ADJUST INITIAL POT FOR ZERO INDICATION.

Note:
If desired, digital zero can be set at analog, zero by going to expand mode, to defeat AZM before adjusting initial pot above. --Another method would be to momentarily interrupt power -- flashing zero LED indicates zero LED comes on and a zero indication is displayed.

E. RECHECK SPAN BY REAPPLYING TEST WEIGHT.
It should be correct but may be off one or two increments. Fine tuning the span pot will correct this, and it should not effect initial.

F. FINAL SPAN MUST BE ADJUSTED WITH FULL CAPACITY WEIGHT ON THE PLATFORM.

Note:
When the final adjustment of initial and span is performed it may be desirable to use expand mode. Turn program SW3-5, 6, 7 off to expand display. See page 8 for explanation of expand mode and how to determine the correct displayed indication

3.5 LOAD CELL OVERLOAD STOP

By using expand mode the over capacity blanking is defeated and the load cell overload stop can be adjusted by using weight on the platform. See page 8 of this manual for value of weight on platform to set stop. When using this method the displayed expanded value must be calculated per page 8.

Steelyard Unlocking and Uptravel Adjustment

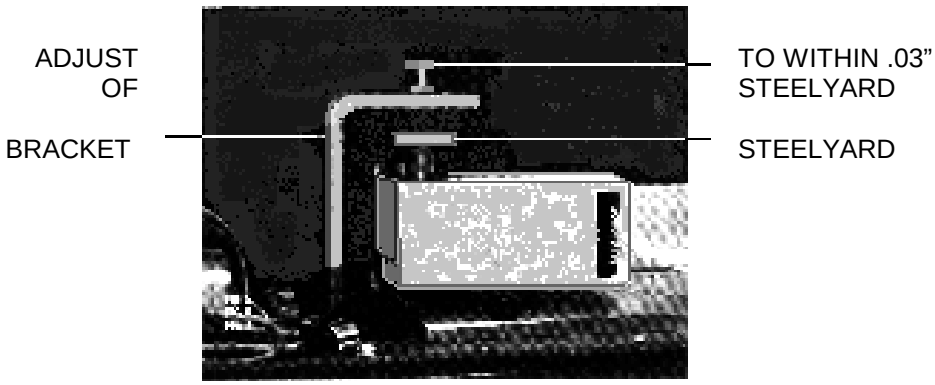
The scale is shipped with the steelyard secured to the support bracket. This results in on weight on the load cell during shipment.

The same screw that secures the steelyard for shipment is used as a backstroke stop for the steelyard when moved to a tapped hole in the bracket.

Procedure

1). Remove screw and jam nut that goes through untapped clearance hole in bracket to a tapped hole in the steelyard.

2). Replace screw in tapped hole of bracket and adjust for .03" maximum gap between end of screw and top of steelyard and tighten jam nut.



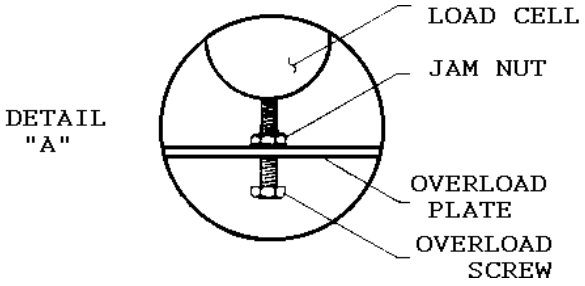
Digital Indicator

1). Connect Digital Indicator to 120 volt (±10%), 50/60 Hz grounded power supply.

2). Allow Load Cell-Digital Indicator system to warm up for a period of thirty minutes.

3). Proceed according to prevailing indicator set-up instructions --lb or kg mode of operation, decimal point location, number of increments, etc.

CANTILEVER LOAD CELL OVERLOAD PROTECTION STOP ADJUSTMENT



IMPORTANT NOTES:
This is a critical adjustment. Overloading load cell may result in load cell malfunction, weighing inaccuracies and may permanently damage cell.

Test Weight requirements for setting the OVERLOAD STOP depends upon the scale capacity. See page 8.

DIGITAL INDICATOR MUST BE CALIBRATED BEFORE THE FOLLOWING PROCEDURE MAY BE USED.

Overload stop has been adjusted at factory but my be adjusted, if needed, (load cell replacement) by the following procedure.

1). Place digital indicator in expand mode - SW3 - 5,6,7 off (See indicator section for explanation of expand mode).

2). Place the required test weight load on the scale platform.

3). Adjust stop until the displayed indication begins to decrease. Lock stop securely in place after each adjustment.

Note table _expanded mode indication for overload stop setting for each specified scale capacity.

4). Remove test weights from scale platform and return SW3-5,6,7 to appropriate setting --- (see digital indicator section page *).

CAUTION
Use of a thin wrench to tighten locknut is mandatory. Any stress from wrench against load cell cover while tightening nut could damage load cell strain gauges.

4. 208 CONVERSIONS

4.1 PHILOSOPHY

The 280 family is designed as a digital indicator replacement for the mechanical bench and portable scale, specifically the 2071, 2081, 2181, and 2881 scales and blackline.

The following procedures do not take into account scales that have jug weights, extended back balance weights, or other non-standard accessories that alter the gross capacity of the scale. For these cases each individual scale will have to be treated uniquely.

This write-up will cover the basics of the installation of the 280 column. Refer to the indicator section for programming and calibration techniques.

An important thing to keep in mind is that the 280 is limited to maximum of 3000 increments (1.5K, 2.0K, 2,5K, and 3.0K, selectable by program switches).

The scale base should be checked over and worn parts replaced. All mechanical adjustments should be made before the conversion starts. The idea is to have a mechanically sound base - lever system to ensure repeatability - accuracy and eliminate shift problems.

4.2 CONVERSION PROCEDURE

1. Before removing the cabinet/head of the scale to be converted, determine what I s to be done with it. It is recommended that the pendulums, dial and tare beam levers be secured as for shipping. (This is in addition to using the locking handle).

2. Disconnect steelyard.

3. Disconnect wheel lock bracket (if applicable).

4. Remove the four (4) bolts which attach the cabinet to the base and then remove cabinet / dial housing and set aside.

5. **FOR 2881 ONLY** (TALL COLUMN)

STEELYARD ADJUSTMENT

The steelyard length of the 280 must be readjusted for use on the fabricated steel bases used in the 2881. Before mounting the column on the 2881 base, the steelyard must be removed and the steelyard length must be shortened to 51.70 inches.

The steelyard can be removed easily by following this procedure:

1. Remove screw from rebound bracket to untie the steelyard. Keep Screw. Then remove the bracket and take steelyard off of cone pivot of load cell.

2. The steelyard can then be slipped down through the column and brought out of the bottom.

3. Readjust the length of the hook assembly to 51.7 inches.

4. After adjusting, reinstall the steelyard in the column. Be sure to reinstall the rebound bracket. Replace screw in tapped hole of bracket & adjust to within .03" of steelyard.

(This keeps steelyard from coming off of cone pivot which could result in damage to the load cell).

6. If scale has wheels:
Attach wheel lock support arm to wheel lock handle bracket. For all conversion except 2881, align center and bottom hole of wheel lock handle with the holes in the support arm.

For 2881 use the center and top holes of support arm.

7. Install column to base of scale and secure with the four (4) bolts.

8. Connect steelyard to nose iron. The extension lever should be level if the steelyard length is correct.

9. WHEEL LOCK HOOK - UP (If Applicable)

NOTE:
Ensure back stroke (up travel) screw is set to keep steelyard from popping off of load cell cone pivot.

The base and column should be layed on its side to gain access to the wheel lock support arm and lock handle bracket.

Connect the support arm to each wheel lock lever. Secure with the "X" washers pinching close the wide end with pliers.

Check operation of wheel lock. With wheel lock handle moved to the up and stowed position, the wheel lock levers should drop into the cogs of the brake wheel.

10. Lift scale to the up-right position and ensure levers are seated properly.

11. Program scale according to the number of increments, increment size and decimal pt. selection. (See program switches in the indicator section of manual).

12. Check that all connectors on the PCB and load cell are secure.

13. Apply power and do a rough initial and span calibration, then allow scale-instrument to warm-up for at least a half hour with covers on. Then do a shift test and final calibration.

14. Use column adapter on Blackline conversions.

5. INTERCONNECTING DIAGRAM