8581

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:

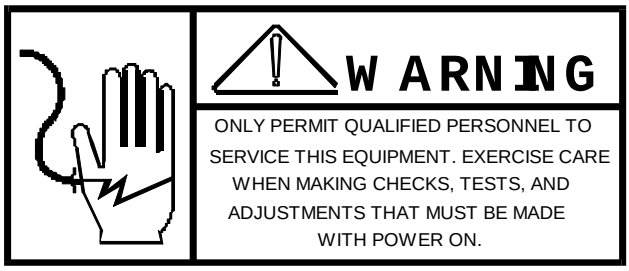
METTLER TOLEDO
Training Center
P.O. Box 1705
Columbus, Ohio 43216
(614) 438-4400

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.



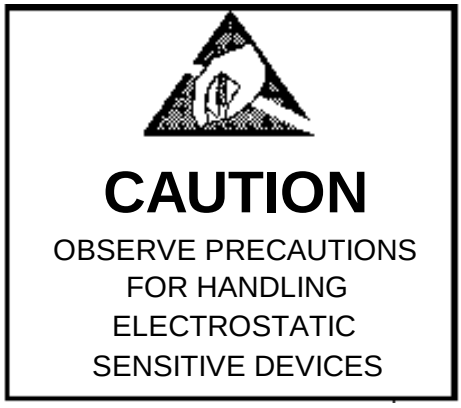
- **DO NOT** connect or disconnect a load cell scale base to the equipment with power connected or damage will result.

- **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.



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1. GENERAL DESCRIPTION

The DigiTOL ™ Model 8581 parts counting scale is a high resolution, self contained scale designed for use in most industrial environments. The 8581 MUST NOT be used in areas classified as HAZARDOUS by the National Electrical Code (NEC) because of combustible or explosive atmospheres, or in areas that contain extreme dust, moisture or corrosive materials.

The 8581 XR version, (factory numbers 8581-2001, 2002), supplies a displayed weight resolution of up to 60,000 divisions for sampling and counting small parts with greater ease and accuracy.

The 8581 is programmed and calibrated by means of the keyboard. The 8581 may also be used for straight weighing applications.

1.1 STATEMENT OF PERFORMANCE

The performance of any count-by-weighing scale is dependent on uniformity of weight per piece, number of pieces in the sample, individual piece weight and the percent of rated load placed on the scale. In application, count accuracy is also dependent upon the ability of the operator to read and record the count information accurately.

The Model 8581 high resolution parts counting scale significantly reduces count errors caused by the operator. In most applications, it provides better practical accuracy than either hand counting or other mechanical techniques. With the proper scale, count accuracy of ± one part is attainable. However, the most significant variable is non-uniform weight of the parts to be counted. This variable is not controllable by the scale system.

1.2 ACCURACY CONSIDERATIONS

Counting accuracy is determined primarily by these factors:

1. Digital resolution of the sample weight.

2 Variation in weight of parts to be counted.

Item 1 is the most frequent cause of parts counting inaccuracy because of the user’s desire to count and handle the minimum number of sample pieces. For example, with a sample weight of 0.05% of full scale, sample weight resolution is ± 1 part in 250, counting error is ± 0.4% at best. Use of 0.1% minimum sample weight will significantly improve counting accuracy.

Item 2 is not under control of the Parts Counter, but is a factor which merits serious attention by the user. The overall count accuracy can be no better than the piece to piece variation and may be much lower if the sample is not representative of the average piece weight.

1.3 FEATURES

- Three (3) separate operator displays. One each for count and weight, and one data display to allow recall of tare weight, average piece weight, I.D. and percent accuracy.

- Sealed polycarbonate keyboard with embossed edges and tactile feedback with audible tone (selectable).

- Order independent entry of tare and sample/ APW.

- Ability to repeat tare and/ or average piece weight from one transaction to the next.

- Twenty one (21) internal count accumulators.

- Keyboard entry of 12 digit numeric I.D. The 8581 can store up to (20) separate ID's.

- Internal resolution of up to 1 part in 1,200,000 of scale capacity, (8581 XR version, factory numbers 8581-2001, 2002).

- Variety of settings for sufficient sample.

- Pushbutton zeroing (within ±2% of scale capacity).

- Standard 20 mA current loop output for printer or computer.

- Optional RS-232C output for printer or computer.

- Remote control via bi-directional printer port with ASCII inputs for print, tare, sample, accept sample, clear to gross, and zero functions.

- Automatic countup, countdown, single scaled full container counting.

- Keyboard selection of lb or kg weighing mode. The 8581 XR version (factory number 8581-2001, 2002) uses gram weighing mode only.

- Automatic Zero Maintenance.

2. SYSTEM DESCRIPTION

The 8581 consists of 5 major blocks which follow:

1. Transformer
2. Logic Board
3. Load Cell
4. Display Board
5. Keyboard

2.1 TRANSFORMER

The Transformer supplies stepped down AC power directly to the logic board. The export 8581, Factory number (8581-0011, 0012, 0013, 0014, 0015), utilizes a switchable power supply, allowing selection between 120/220/240 VAC.

2.2 LOGIC BOARD

1. Rectifies and regulates power for the complete scale.

2 Accepts data entry from the keyboard.

3 When Set Up mode is selected (Section 4) the Logic PCB provides access to a menu of selectable options and scale calibration mode. When selections are made they are stored in a non volatile RAM memory. No battery is necessary to support RAM memory when power is removed from the scale.

When Calibration is performed, zero and span parameters are stored in RAM memory as well. No physical adjustments are required for calibration.

4. The Logic PCB performs all data calculations and supplies this information to the Display PCB.

5. The Logic PCB accepts weight information in digital from the DigiTOL™ load cell.

2.3 LOAD CELL

The Load cell is a Digital, moment-insensitive type. It mounts directly to the base and spider, and requires not adjustment for shift, zero or span. The cell contains all analog circuitry including a microcomputer for control and bi-directional communication between the load cell and the Logic PCB.

The 8581 XR Parts counting Scale, (factory numbers 8581-2001, 2002) utilizes a new, ceramic capacitance technology in it's DigiTOL™ load cell to measure weight and count parts with extremely high precision and resolution.

2.4 DISPLAY BOARDS

The Display PCB accepts and displays weight and count data from the Logic PCB. The display PCB also displays recalled data and error codes.

2.5 KEYBOARD

The 8581 provides a 20 key, numeric and control keyboard. The keyboard is used for operator input and for programming and calibration.

3. SPECIFICATIONS

3.1 ELECTRICAL AND PHYSICAL SPECIFICATIONS

1. Environment

The Model 8581 is operable from 32 to 104° (0 to 40°C) at 10 to 95% relative humidity, non-condensing.

Zero temperature coefficient is +60 PPM/°C maximum.

Span temperature coefficient is +34 PPM/° C maximum.

The 8581 XR is operable within the range of 50 to 104°F (10 to 40°C), 10% to 95% relative humidity, non-condensing. Zero temperature coefficient is 15 ppm / °C maximum.

2. Power Requirement

The 8581 is operable at 120 V, (+10%, - 15%), 60Hz. Power consumption is less than 25 W.

3. U.L. & C.S. A. Standards

Materials, components and electrical design comply with UL and CSA standards and requirements, including grounding of all metal parts, fusing, etc.

4. RFI

This unit is intended for use in moderate RF fields and meets NIST Handbook 44 standards for RFI protection.

5. Appearance and Dimensions

The Model 8581 is fog white with a black platter assembly and multi-color keyboard.” The unit is 5.4” (137 mm) high, 14.7’’ (373 mm) wide and 14.6’’ (370 mm) deep. The 8581 weighs approximately 20 lb (9 kg).

6. Hazardous Areas

In locations classified as hazardous by the National Electrical Code (NEC) because of combustible or explosive atmospheres or materials, special precautions are required. **DO NOT USE THE 8581 IN THESE LOCATIONS!**

3.2 EXTERNAL FUNCTIONS

The 8581 keyboard controls all weighting and printing functions. The keyboard contains twenty (20) keys to provide the ability to program and calibrate the scale and enter numeric data: e.g. tare weight, average piece weight, sample count, etc,. and initiate data output to a printer or other compatible device.

3.3 DISPLAY FORMAT

The 8581 contains three (3) separate blue-green, vacuum fluorescent displays. The digits are seven-segment, 0.5″ high. The weight display is a five-digit field and continuously shows gross or net weight. The count display is a six-digit field that can display tare weight, average piece weight, I.D. or calculated percent accuracy.

3.4 CONFIGURATION GUIDE

Chart 1

Factory Number +	Programmed Scale Capacity	Platform Size	Load Cell Capacity	Notes
8581-0002	10 lb X 0.001 lb	8.5 in X 8.5 in	7.5 kg	
8581-0003			15 kg	
8581-0004	25 lb X 0.002 lb	11 in X 14.5 in	30 kg	
8581-0005			60 kg	
8581-0011	50 lb X 0.005 lb	11 in X 14. 5 in	3.75 kg	*#
8581-0012			7.5 kg	*#
8581-0013	100 lb X 0.01 lb	11 in X 14.5 in	15 kg	*#
8581-0014			30 kg	*#
8581-0015	5 lb X 0.0005 lb	8.5 in X 8.5 in	60 kg	*#
8581-1001			3.75 kg	*
8581-1002	10 lb X 0.001 lb	8.5 in X 8.5 in	7.5 kg	*
8581-1003			15 kg	*
8581-1004	25 lb X0.002 lb	11 in X 14.5 in	30 kg	*
8581-1005			60 kg	*
8581-2001	50 lb X 0.005 lb	11 in X 14.5 in	1 kg	!
8581-2002			5 kg	!
	100 lb X 0.01 lb	11 in X 14.5 in		
	5 lb X 0.0005 lb	8.5 in X 8.5 in		
	10 lb X 0.001 lb	8.5 in X 8.5 in		
	25 lb X 0.002 lb	11 in X 14.5 in		
	50 lb X 0.005 lb	11 in X 14.5 in		
	100 lb X 0.01 lb	11 in X 14.5 in		
	600 g X 0.01 g	4.9 in diameter		
	3000 g X 0.01 g	8.5 in by 8.5 in		

\+ Factory number is located on the I.D. plate mounted on the left side of the 8581 enclosure.
* These contain CMOS Digital Load Cells.

International versions utilize a switchable power supply, allowing selection between 120/220/240 VAC. These also use International Symbol keyboards.
! These contain Ceramic Capacitance Digital Load Cells

3.5 DEFAULT CAPACITIES

Chart 2

Load Cell Capacity	Capacities		
	lb	kg	g
1 kg	N.A.	N.A.	600 X 0.01
3.75 kg	5 X 0.0005	2 X 0.0002	2000 X 0.2
5 kg	N.A.	N.A.	3000 X 0.1
7.5 kg	10 X 0.001	5 X 0.0005	5000 X 0.5
15 kg	25 X 0.002	10 X 0.001	10000 X 1
30 kg	50 X 0.005	20 X 0.002	20000 X 2
60 kg	100 X 0.01	50 X 0.005	50000 X 5

4. INSTALLATION INSTRUCTIONS

To unpack and set up the 8581, use the following procedure.

4.1 SET UP PROCEDURE

1. Examine the shipping box for any signs of damage. IF DAMAGE IS FOUND, MAKE A CLAIM WITH THE CARRIER IMMEDIATELY.

2. Open the box, remove the scale and place the scale on a flat level surface.

   The high resolution of the 8581 XR requires that certain precautions be made with respect to the physical environment of the scale. For best counting performance a stable, vibration free support surface must be provided for the 8581 to rest on. The scale platter must be protected from air currents which can cause erratic count readings.

CAUTION: Do not lift the scale by the platter or subplatter. Grasp the scale by the base to lift. Do not stress or bump the sides of the platter on the 5 lb capacity 8581 or the 8581 XR, as this will cause a side torque that may damage the load cell.

3. The 600 g capacity 8581 XR (factory number 8581-2001), is shipped with the platter and subplatter assembly removed. Follow steps 4.1, # 3.(a-c).
   and then proceed to step 4.1.7.

a). Level the scale by turning the 4 adjustable feet on the bottom of the scale. The feet should be adjusted so the scale does not rock. The correct position of the level bubble is shown in Figure 2.

b).When the scale is properly leveled, carefully install the subplatter onto the load cell. Hand tighten the central mounting screw until finger tight. DO NOT OVERTIGHTEN THE SUBPLATTER MOUNTING SCREW as damage to the load cell may result. Carefully place the platter on the subplatter.

c). Proceed to step 4.1, #3 (g).

4. The 5 lb capacity 8581 (factory number 8581-1001), has additional shipping hardware that must be removed. Follow steps 4.1, #4 (a-d). For all other 8581's except the 600 g capacity 8581 XR proceed to step 4.1, #5.

a). Remove the rubber hand securing the 8" square plastic platter to the subplatter.

b). Grasp the plastic platter by the edges and lift straight up to remove it. The Platter is held by loop fasteners in the corners.

c). Remove the two 8-32 screws and rubber O-rings from the top of the subplatter. These parts along with the shims, MUST BE SAVED as they are required any time the scale is transported. See Figure 1.

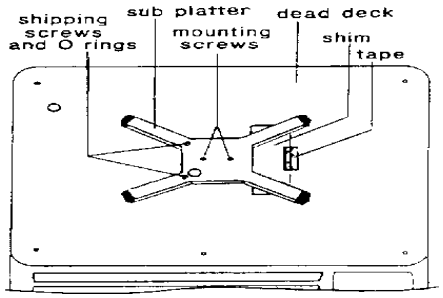


Figure 1

d). Remove the tape and shim from the top of the right side of the dead deck. See Figure 1. (Skip step 4.1, #4).

5. Remove the platter by lifting upward and locate the level bubble.

6. Level the scale by turning the adjustable feet on the bottom of the scale base in or out. The feet should be adjusted so the scale does not rock. The correct position of the level bubble is shown in Figure 2.

Figure 2

7. Install any optional kits at this time.

8. Connect this equipment to a properly grounded outlet of the proper voltage and amperage as specified on the equipment..

4.2 PROGRAMMING

This section describes the programming of the operating mode and features as well as the calibration.

Sample displays are shown along with programming prompts. Described under each sample display are the acceptable answers along with the effect the answers will have on the unit's operation.

The keys listed below are redefined as follows during SETUP and calibration.

PRINT key - Accept displayed selection and advance to next step.

ZERO key - Skip to [SETUP OFF], or to clear and restart a numeric entry.

0 key - Turn a SETUP step ON and advance to next SETUP step.

To program and calibrate the unit, locate the slid switch access hole on the top left side of the outer cover (see Figure 3). To gain access to this switch access hole on Factory Number 8581-0003, -0004, -0005,-1003,-1004, and -1005 remove the platter. On Factory Number 8581-0002, it will be necessary to remove the platter, subplatter, and ''Dead Deck'' in order to gain access to the hole. Factory Number 8581-1001 and -1002 have a hole cut into the dead deck with a button inserted. Remove this button to access the set switch. When the access hole has been located, slide the switch (down inside) toward using a pointed non-conductive object. Avoid using a small object that could be easily dropped into the unit.

The display should show [F1] in the weight field of the display. The unit is now ready for programming.

NOTE: The F revision or higher Logic PCB (part number F122683 00) is now included in all new 8581's, beginning with date code QQ. The new Logic PCB software modifies and adds several programming steps in the set up mode. To determine which revision level is present in the 8581, check the powerup self test display. On powerup the 8581 will display all eights, then all periods to test display segments. The third display will show the software part number and revision level
[122681 L0*], the (*) is the software revision level. An [L07] higher will be displayed for an F revision or higher PCB.

CAUTION: When it is necessary to remove the platter support assembly, first

slowly remove the two mounting screws, then the platter support to insure that the load cell RFI cover does not tear. Refer to Section 6.5, Figure 6.

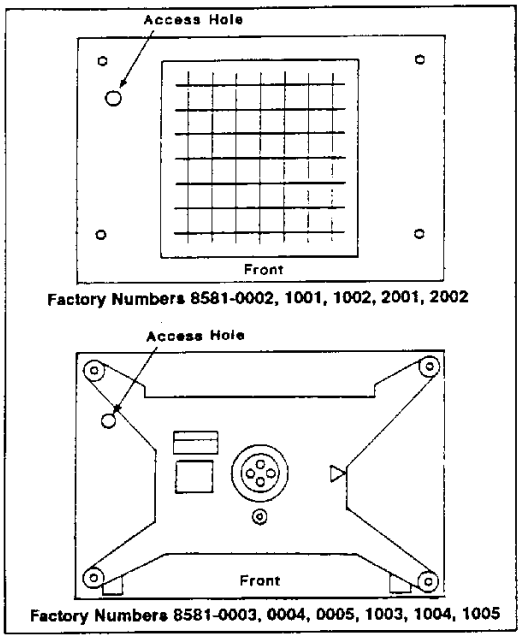


Figure 3

[F1.] Access Operational Functions
Press:

1 - To access the programming of the operational functions, the unit will then step to [F1.1].

0 - To bypass the programming of the operational functions, the unit will then step to
[F2].

[F1.1 OFF] Operation Function Override Enable
Press:

1 - ON - Allows the operator to change the programming of the 7 operational functions (F1.2 through F1.8) at power up. See operating instructions.

0 - OFF- Operator will be unable to change operational functions at power up.

[F1.2 OFF] I.D. ENABLE
Press:

1- ON- Allows ID entry.

0- OFF- Disables ID entry. The display will skip to Step [F1.5].

[F1.3 OFF] I.D. Mandatory
Press:

1- ON- The ID cursor will flash ON and OFF requiring that an I.D. number must be entered to complete a count sequence.

0- OFF- I.D. entry is not necessary to complete a count sequence.

[F1.4 OFF] I.D. Auto Clear
Press:

1- ON- ID will automatically clear when the scale returns to zero.

0- OFF- ID will be retained until the clear pushbutton is depressed.

[F1.5 ON] Tare Auto Clear
Press:

1- -ON- Tare will automatically clear when the scale returns to zero.

0- -OFF- Tare will be retained until the clear pushbutton is depressed.

[F1.6 ON] A.P.W. Auto Clear
Press:

1- ON- Average piece weight will automatically clear when the scale returns to zero

0- OFF- Average piece weight will be retained until the clear pushbutton is depressed.

[F1.7 ON] Average Piece Weight Enhancement
Press:

1- ON- To activate the enhanced sample feature.

0- OFF- The unit will operate in the normal count mode.

[F1.8 OFF] Percent Accuracy Display Enable
Press:

1- ON- To allow the percent of accuracy to be displayed in the data field when the recall pushbutton is depressed.

0- OFF- The unit will operate in the normal count mode.

[F1.9 1] Count Display Averaging

The 8581 utilizes a ‘‘rolling average’’ filter for the count display. The count readings from the selected number of display updates are averaged together then the count display is updated. Count display averaging provides a more stable count display when the 8581 is used to count parts with a very small APW in areas of excessive vibration.

Count display averaging results in a slower count display update rate.

[F2.] Access Unit Function Setup
Press:

1- To enter into the unit function set up routine. The display will step to [F2.1].

0- To bypass the unit function set up routine, the display will then step to [F.3].

[F2.1 OFF] APW/ Pieces per Unit Weight Enable
Press:

1- ON- If the average piece weight is to be entered and calculated inpieces per unit weight.

0- OFF- If the average piece weight is to be entered as a decimal value.

[F2.2 X.XX] Minimum Sample Select

Allows selection of the percent of scale capacity that must be reached before an average piece weight may be calculated, and a count sequence may be completed. The available percentages are 0.10%, 0.05%, 0.02% and 0.00%.

Press:

1- ON- If the displayed number is the correct selection.

0- OFF- to cycle the display through the various selections. When the correct value is displayed, press 1.

[F2.3 ON] Auto Sample Acceptance
Press:

1- ON- When additional sample pieces required are to be automatically accepted.

0- OFF- When additional sample pieces are to be entered via the sample pushbutton.

[F2.4 ON] Tare Enable
Press:

1- ON- To enable tare to be taken.

0- OFF- To disable all tare functions. The display will skip to [F2.6].

[F2.5 OFF] Keyboard Tare
Press:

1- ON- To allow a hand entered tare via the keyboard as well as pushbutton.

0- OFF- To disable hand entered tare via the keyboard. The pushbutton tare function will continue to operate.

[F2.6 OFF] lb/kg Switching
Press:

1- ON- To enable lb (pound) and kg (kilogram) switching via the keyboard pushbutton.

0- OFF- To disable the lb/kg switching, the scale will weigh in whichever mode selected for power up only.

NOTE: lb/kg switching is disabled when both 2.7 and 2.8 are OFF.

[2.7 2] Calibration Units

For 8581’s with F revision PCB’s or newer (revision L07 or higher on powerup display).

This step selects the weight units to be used for display and calibration purposes. The 8581 XR (factory numbers 8581-2001, 2002) require gram calibration units be selected, [F2.7 2], for proper operation.

Selection	Option Description

0	pound units
1	kilogram units
2	gram units

NOTE: If gram calibration units is selected, set up step [F2.7 2], then lb/kg switching is disabled and the lb cursor is illuminated to indicate grams. A new display lens (part number 131932 00A) can be installed which has gram legend in place of the lb legend.

[F2.7 ON] Calibrate in Pounds

For 8581's with E revision PCB's or older (revision L06 or lower on powerup display).

Press:

1- ON- If the test weights to be used during calibration are to be avoirdupois (lb) test weights.
0- OFF- If the test weights to be used during calibration are to be metric (kg) test weights.

[F2.8 ON] Power Up in Pounds Enable
Press:

1- ON- When the scale is to weigh in pounds at power up.

0- OFF- When the scale is to weigh in kilograms at power up.

[F2.9 OFF] Beeper Enable

1- ON- To turn ON the keyboard beeper.

0- OFF- To turn the beeper OFF.

[F2.10 OFF] Linearity Compensation

For 8581's with F revision PCB's or higher (revision L07 or higher on powerup display).

Press:

1- ON- Two step linearity compensation calibration.

0- OFF- No linearity compensation.

NOTE: When using linearity compensation, once half scale capacity and full scale capacity must be used. If less than full capacity is used, a calibration error may occur beyond the test weight used.

[F2.11 OFF] Enhanced APW Repeatability

For 8581's with F revision PCB's or higher (revision L07 or higher on powerup display).

Press:

1- ON- The Enhanced APW Repeatability feature is enabled.

0- OFF- Enhanced APW Repeatability is disabled.

NOTE: Enabling this feature ensures maximum APW accuracy and repeatability. when sampling, the APW calculation will be delayed for approximately two seconds.

[F2.12 ON] AZM in Count Mode

For 8581’s with F revision PCB’s or higher (revision L07 or higher on powerup display).

This step controls if the AZM function will operate in the count mode and if any small residual count will display when the weight display is reading zero.

Press:

0- OFF- If a weight greater than 10 d is placed on the scale platter, no motion is detected, and then weight is removed, AZM will operate at a rate of 0.4 d per second to maintain a zero weight display.

1- ON- AZM is disabled in the count mode and the count display will show whatever residual count exists based on the scale’s internal divisions and the APW entered, regardless of the weight display.

[F2.13 5] APW Decimal Point Position

For 8581’s with F revision PCB’s or higher (revision L07 or higher on powerup display).

This step controls the number of digits to the right of the decimal point in the APW display.

Press:

5 key- APW display with 5 digits after the decimal point.

6 key- APW display with 6 digits after the decimal point.

[F3.] Access Calibration Setup
Press:

1- ON- To access the calibration and weighing parameters set up routine.

0- OFF- To bypass the calibration and weighing parameters set up routine. The display will then proceed to [F.4].

[F3.1 OFF] Expanded Weight Display
Press:

1- ON- To expand the weight display X 10.

0- OFF- To bypass the expanded weight mode.

NOTE: The expanded weight display can be read in the ‘‘data’’ display field with the unexpanded weight displayed in the weight field.

[F3.2 OFF] Configure Scale

The unit is ready to be calibrated at this time.

Press:

1- ON- The scale will proceed to step F3.3, Capacity select.

0- OFF- The scale will skip the calibration sequence and proceed to step F3.4, AZM.

[F3.3 25] Capacity Selection

For 8581’s with F revision PCB’s or higher (revision L07 or higher on powerup display).

Enter in a valid capacity using the numeric keys on the keyboard. Refer to step F2.7 and Cart 3 for valid capacity selection.

[F3.3 0.005] Increment Size

For 8581’s with F revision PCB’s or higher (revision L07 or higher on powerup display).

Press:

1- ON- If the displayed information is correct.

0- OFF- If the displayed information is incorrect. The display will then cycle to the next selection. When the displayed information is correct, press 1.

Valid Capacity Selections

Chart 3

Total Scale Capacity in lb, kg, or g	Total Number of Divisions					
	3000	6000	10000	12500	30000*	60000*
Division Size						
2 kg			0.0002			
3 lb. kg	0.001	0.0005				
5 lb. kg			0.0005			
6 lb. kg	0.002	0.001				
10 lb. kg			0.001			
12 lb. kg		0.002				
15 lb. kg	0.005					
20 lb. kg			0.002			
25 lb. kg				0.002		
30 lb. kg	0.01	0.005				
50 lb. kg			0.005			
100 lb			0.01			
600 grams	0.2	0.1			0.02*	0.01*
2000 grams			0.2			
3000 grams	1.0	0.5			0.1*	
5000 grams			0.5			
10000 grams			1			
20000 grams			2			
50000 grams			5			

* -8581 XR (factory numbers 8581-2001, 2002) only.

[F3.3 050] Capacity Select

For 8581’s with E revision PCB’s or lower (revision L07 or lower on powerup display).

The unit is asking what the total capacity of the scale is to be. If the scale is to be calibrated in pounds (lb), your selections will be 5 lb, 10 lb, 25 lb, 50 lb or 100 lb. If the scale is to

be calibrated in kilograms (kg), your selections will be 2 kg, 5 kg, 10 kg, 20 kg or 50 kg.

NOTE: Capacity MUST be selected in accordance with the 8581 Factory Number and Capacity (See Section 3.3).

Press:

1- ON- If the number displayed is the correct capacity selection. The display will then read [E SCL].

0- OFF- If the number displayed is not the correct capacity selection. the display will then advance to the next capacity selection. Repeated pressing of this pushbutton will cycle the display through all capacity selections. When the desired selection is displayed, press 1.

CALIBRATION PROCEDURE

There are two procedures for calibrating the 8581. If linearity compensation is disabled, (SETUP step [F2.10 OFF], then use the following calibration procedure, LINEARITY COMPENSATION DISABLED. if linearity compensation is enabled, (SETUP step [F2.10 ON], then skip to the calibration procedure, LINEARITY COMPENSATION ENABLED.

[F3.3 E SCL] Empty Scale

Empty the scale platter. Press the PRINT key to advance to the next step.

[F3.3 16 CAL] Zero Count Down

The scale counts down from 16 to 0 and calculates a zero reading. If motion is detected the count will restart from 16.

[F3.3 ADD LD] Add Load

Place a test weight as close to capacity as possible, 50% of scale capacity minimum, on the scale platter. Press the PRINT key.

[F3.3 XXXXXX] Enter Test Weight Value

Enter the test weight used, in whole numbers and press the PRINT key.

If an ''E12'' or ''E13'' error code is displayed, press the ZERO key to back up to ''ADD LD'' and reenter the correct test weight value.

[F3.3 16 CAL] Span Count Down

The scale counts down to 9 and checks to see that a workable build has been programmed for the load cell. If the check is successful the count down will continue and [CAL D] is displayed.

If insufficient counts are received from the load cell, the scale will recalculate new parameters and attempt to download them into the load cell. If the scale is unable to increase the count from the cell to the proper level, and ''E11'' error code will be displayed to indicate that the scale is unable to calibrate with the current build.

[F3.3 E SCL] Empty Scale

Remove the test weights from the sale and press the PRINT key. This prompt will only occur if the scale increased the number of counts from the load cell during span calculation.

[F3.3 16 CAL] Zero Count Down

The scale counts down from 16 to 0 and while zero is calculated. If motion is detected the count will restart from 16. This step occurs only if the scale increased the number of counts from the load cell during span calculation.

[F:3.3 CAL D] Calibration Done

Calibration is completed and display will automatically advance to SETUP step [F3.4].

[F3.4 ON] Auto Zero Maintenance Enable
Press:

1- ON- To enable the auto zero maintenance feature. AZM will keep the unit on zero in spit of small changes weight of up to 0.6 increment per second.

0- OFF- To disable the auto zero maintenance feature.

[F3.5 0] Digital Filtering Selection

For 8581's with F revision PCB's or higher (revision L07 or higher on powerup display).

This feature compensates for environmental instability. A digital filter setting of 0 is recommended for most applications.

For 8581 XR a digital filter setting of 1 is recommended.

Press:

1- ON- To accept displayed selection.

0- OFF-

Number	Filter Selection
0	None
1	Light
2	Heavy

[F3.6 OFF] Tare Interlock

For 8581's with F revision PCB's or higher (revision L07 or higher on powerup display).

Press:

1- ON- Tare interlock enabled.

0- OFF- No tare interlock.

NOTE: Tare interlock includes the following restrictions.

- Tare may only be entered in the gross weight mode.
- Tare may only be cleared while at gross zero.
- Keyboard tare may only be entered while at gross zero.
- The lb and kg cursors are not turned off to indicate motion.
- Keyboard tare must be entered by whole increment values.

[F4] Access Printer Output
Press:

1- ON- To access output functions set up.

0- OFF- To bypass printer output functions, the display will skip to ‘‘Save.’’

[F4.1 0] Data I/O Active

For 8581’s with F revision PCB’s or higher (revision L07 or higher on powerup display).

This setup selection controls operation of the printer port.

Press:

1- ON- If the displayed information is correct.

0- OFF- If the displayed information is incorrect. The display will then cycle to the next selection. When the displayed information is correct, press 1.

Number	Data I/O Selection
0	Both the input and output are disabled.
1	Data output is active, input is disabled.
2	Both the input and output are active.

The 8581 has been modified to accept ASCII characters as remote inputs for certain functions. These commands must be in the same format and same baud rate as selected for printer output. The < > characters are shown for clarity and must not be transmitted. The commands are:

<T> <CR> Tare the scale to zero net.
<C> <CR> Clear the scale to the home position.
<P> <CR> Initiate a print sequence.
<Z> <CR> Zero the scale if in the gross mode and within capture range
when there is not motion.
<T> <XXXX.XX> <CR>
Tare XXXX.XX from the scale weight.
<A> <X.XXXXX> <CR>
Enter X.XXXX as the average piece weight.
<S> <XXXXX> <CR>
Enter XXXXX as the sample quantity.

[F4.1 ON] Printer Active

For 8581’s with E revision PCB’s or lower (revision L06 or lower on powerup display).

Press:

1- ON- If the printer interface is to be active. This will allow access to all of the programming features available in the printer interface.

0- OFF- If the printer interface is to be inactive. This will cause the unit to skip all of the printer interface questions and the display will skip to ‘‘Save’’.

[4.2 OFF] Checksum Active
Press:

1- ON- If a checksum is to be sent to the printer during transmission.

0- OFF- If the printer interface is to be inactive. This will cause the unit to skip all of the printer interface questions and the display will skip to ‘‘Save’’.

[4.3 XXXX] Baud Rate Select

This is the speed at which the selected data is transmitted to the printer. The 8581 printer output is programmable for either 300, 1200, 2400, 4800 or 9600 baud.

Press:

1- ON- If the displayed information is correct.

0- OFF- If the displayed information is incorrect. The display will then cycle to the next selection. When the displayed information is correct, press 1.

[F4.4 OFF] Print Formatting
Press:

1- ON- For single line print format.

0- OFF- If no ID is to be printed.

[F4.6 OFF] Print Consecutive Number
Press:

1- ON- If a consecutive number is to be printed.

0- OFF- If a consecutive number is not to be printed.

NOTE: Consecutive number will advance only when ‘‘Count’’ is accumulated.

[F4.7 ON] Print Gross Weight
Press:

1- ON- If Gross weight is to be printed.

0- OFF- If Gross weight is not to be printed.

[F4.8 OFF] Print Tare Weight
Press:

1- ON- If Tare weight is to be printed.

0- OFF- If the Tare weight is not to be printed.

[F4.9 ON] Print Net Double Width
Press:

1- ON- To print “ Net” weight in double width.

0- OFF- To print “ Net” weight in standard size.

[F4.11 ON] Print Average Piece Weight
Press:

1- ON- If APW is to be printed.

0- OFF- If APW is not to be printed.

[F4.12 ON] Print Pieces
Press:

1- ON- If Piece Count is to be printed.

0- OFF- If Piece Count is not to be printed.

[F4.13 OFF] Print Pieces Double Width
Press:

1- ON- If piece count is to be printed double width.

0- OFF- If Piece Count is not to be printed double width.

[F4.14 OFF] Repeat Print

1- ON- If the repeat print function is to be active.

0- OFF- If the repeat print function is to be inactive.

[F4.15 OFF] Print Commas

For 8581’s with F revision PCB’s or higher (revision L07 or higher on powerup display).

This setup selection controls the decimal point output. Comma output is provided for international applications.

Press:

1- ON- Commas will replace the decimal points in the data output.

0- OFF- Decimal points will be sent in the data output.

[SAVE] Save Programming

For 8581’s with E revision PCB’s or lower (revision L05 or lower on powerup display).

Press:

1- ON- If the changes made during the programmable sequence are to be permanent. These changes are then stored in memory and will remain there during a power failure.

0- OFF- If the changes made during the programming sequence are only temporary changes. If power is interrupted, the programming is lost, and previous programming will be in effect.

[SET UP OFF]

At this time the programming sequence is finished. Remove the platter and turn the setup switch OFF. Reinstall the platter and the scale is ready for operation.

4.3 JUMPER SETTINGS

1. MAIN LOGIC PCB

   There are 3 Jumpers on the Main Logic PCB.

   These Jumpers MUST be set as follows:

   W2- PINS MUST BE JUMPERED TOGETHER. (CLOSED)
   W3- PINS 2 & 3 MUST BE JUMPERED TOGETHER. (CLOSED)
   W4- PINS 2 & 3 MUST BE JUMPERED TOGETHER. (CLOSED)

2. DISPLAY PCB

   There is one Jumper on the Display PCB. Shorting (placing jumper across) the two pins will select comma's on the display. When these two pins are open decimal points are selected.

4.4 SHIFT TEST

1. Test weights equal to one-half scale capacity are used.

2. Scale is operating in the expand mode (F3-1 ON).

3. Weights are placed in turn on the four points shown, A, B, C, and D and the indication does not differ from the other three point by more than 10 expanded increments.

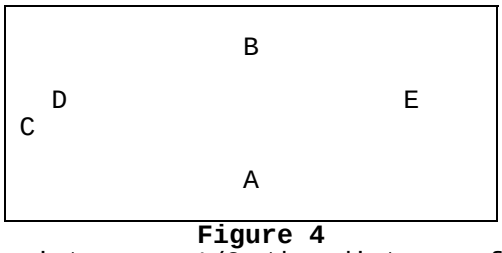


Figure 4

NOTE: The diagrammed points are 1/2 the distance from the center of the platter E, to the edge of the platter.

4. If a shift error does exist, the two possible causes for this are:
   1) mechanical bind or defect, or 2) a defective load cell.

5. Return switch F3-1 to the OFF position.

5. BATTERY OPTIONS INSTALLATION INSTRUCTIONS

FIELD INSTALLATION INSTRUCTIONS
MODEL 8581 BATTERY OPTION

Factory Number 0919-0015
Service Part Number 126960 00A

The battery option kit contains:

QTY.	PART NUMBER	DESCRIPTION
1	(*) 125668 00A	Charger I/O P.C. Board
1	(*) 126953 00A	Interconnect Harness
1	(*) 126966 00A	Battery Pack Assembly
1	(*) 126976 00A	Battery Chassis Assembly
1	(*) 126977 00A	Installation Instructions

Package of Miscellaneous Parts:

4	(*) 126956 00A	Standoff, 5/16-18 X 2.75″
4	(*) 126968 00A	Foot Assembly 5/16-18
1	(*) 126969 00A	Power Harness
1	(*) 126970 00A	Switch Harness
4	R02502 00A	Screw, 8-32 X 1/4″
1	R02544 00A	#8 External Tooth Lockwasher
1	R03298 00A	Nut, 8-32 W/Lockwasher
1	R03612 00A	Screw, 8-32 X 3/8″ W/Lockwasher

(*) May have revision level.

Following are the instructions for installing the battery chassis assembly to a Model 8581 parts counting scale.

5.1 Scale Disassembly

1. Disconnect Power.

2. Remove the platter.

CAUTION: If the 8581 is a **5 pound capacity or less**, the following steps **MUST** be performed. All other capacities can proceed to step 3.

2.1 Reinstall the two 8-32 shipping screws through the sub-platter into the two hex standoffs being careful not to tighten them completely down. They are required to keep the sub-platter from twisting while loosening or tightening the two screws that hold the sub-platter. See figure 1.

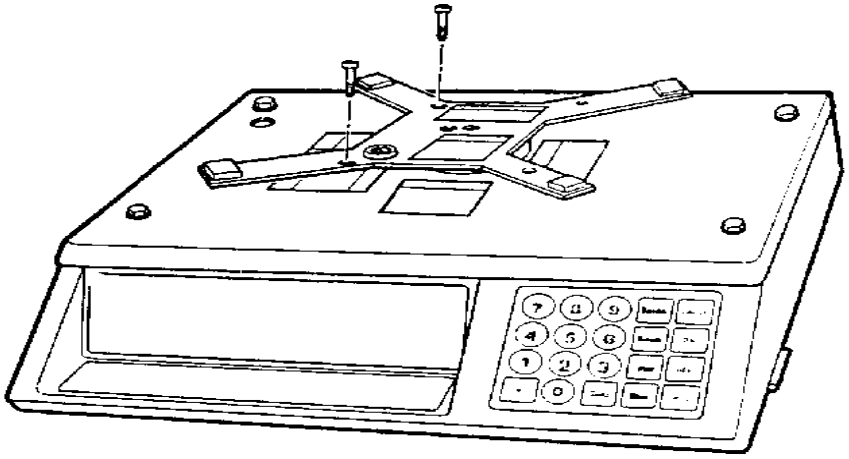


FIGURE 1

2.2 After loosening or tightening the two socket head screws holding the sub-platter to the load cell, remove and store the two 8-32 shipping screws.

3. Remove the two socket head screws** holding the sub-platter and then remove the sub- platter. Remove the four corner cover hold down screws and remove the black screw located in the center towards the front of the scale.

CAUTION:

** The two socket head screws must be removes before the sub-platter is lifted to avoid damage to the fragile bellows that is underneath the sub-platter.

4. Remove the cover(s) from the base and unplug all harnesses to the Logic board (*) 122683 00A. Set the cover aside.

5. Refer to Figure 2. Remove the four crews holding the load cell cover (X). Life the load cell cover and remove the spacer block that is on top of the load cell. Attach the load cell cover on to the base using t woof the screws in diagonal corners. Tighten the crews finger tight.

6. Disconnect all the wires to the fuseholder (XF1) and the line filter (LF1). Remove the nut form the fuseholder and remove the fuseholder. Remove the two screws that hold the line filter to the base and remove the line filter.

(*) - May have revision level.

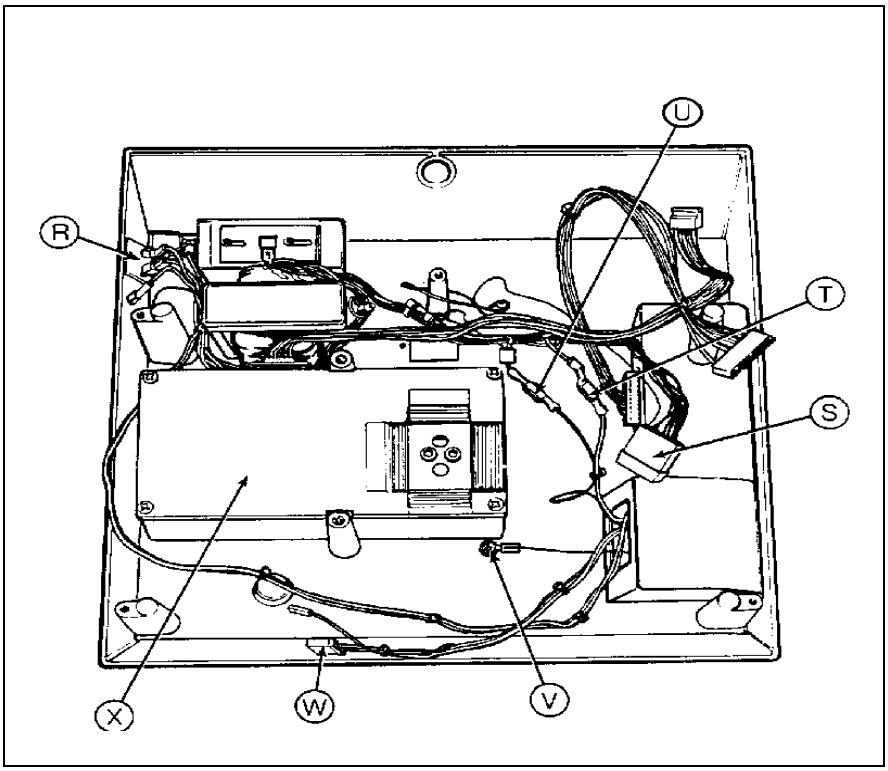


Figure 2

5.2 Installation and Assembly

1. Remove the Charger board (*) 125668 00A from the static bag. Align the four holes in the Charger board with the four white, plastic PCB standoffs (A). See Figure Three. Gently push down on edges of PCB until the PBC has snapped into all four standoffs.

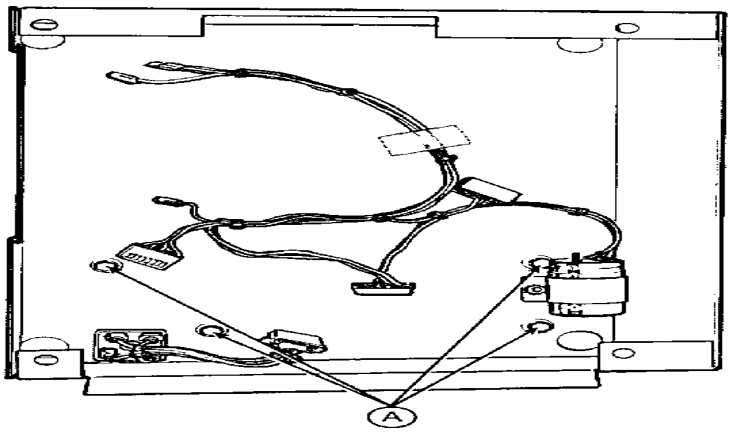


FIGURE 3

2. Connect the bridge rectifier harness (*) 115139 00A (labeled P11) (B) into J11 of the Charger board. See Figure 4.

3. Connect the capacitor harness (*) 126952 00A (labeled P7) (C) into J7 of the Charger board. See Figure 4.

4. Connect the 6 pin connector (labeled P9) of the LED harness (*) 126967 00A (D) into the J9 of the Charger board. See Figure 4.

5. Connect the 9 pin connector (labeled P8) (E) of the interconnect harness (*) 126953 00A (packed with battery pack chassis) into the J8 of the Charger board and connect the single wire connector (labeled PX) (F) of the same harness into TP1 of the Charger board, See Figure 4,

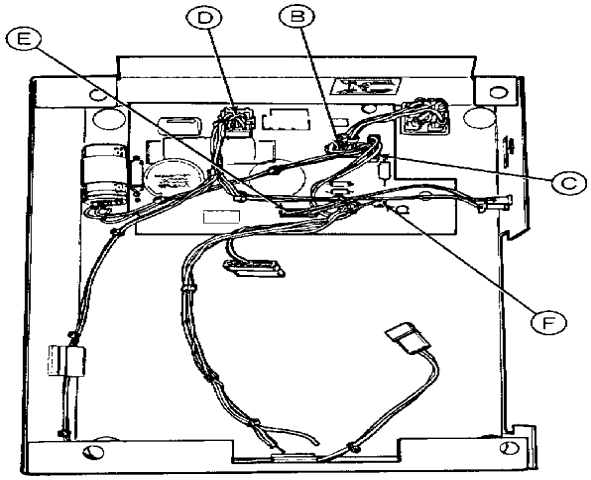


FIGURE 4

6. Install the line filter (G) to the battery chassis assembly reusing the two screws that held it in the base. Install the fuseholder (H) to the battery chassis assembly. See Figure 5.

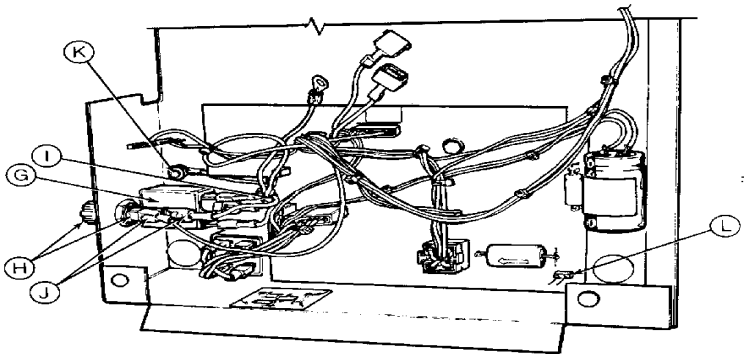


FIGURE 5

7. Connect harness (*) 126969 00A (I) (multiwire harness from the package of misc. parts) to he line filter as follows: The white wire (labeled LF1-N to the N side of the line filter, one nd of the short black white (labeled FL1-L) to the " L" side of the line filter, the green ire (labeled FL2-GND) to the " GND" side of the line filter. See figure 5.

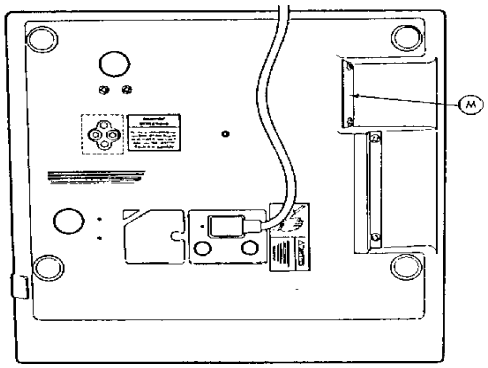
8. Connect harness (*) 126969 00A (J) to the fuseholder as follows: The end of the short black wire (labeled F1-end) that comes from the line filter to the ''end'' of the fuseholder. and the other long black wire (labeled F1-side) to the ''side'' of the fuseholder. See Figure 5.

9. Refer to Figure 5. Install the star lockwasher on the stud (K) near the line filter. Connect the short end of the green wire (labeled E11) to the ground stud, securing with the 8-32 nut w/lockwasher.

10. Connect harness (*) 126970 00A (two wire harness from package of miscellaneous parts) (labeled P10) into J10 (L) of Charger board (*) 125668 00A. See Figure 5.

(*) - May have revision level.

11. Carefully turn the scale base upside down. Remove the rectangular cover plate and two screws (M) located near the printer harness from the scale base to allow a place to run all wires. Remove the four feet from the base. See Figure 6 (below).



12. Mount the battery chassis (N) to the scale base using the four (*) 126956 00A standoffs (O).

Note: Run all wires through the rectangle hole in the scale base that was uncovered by the plate removed in Section 5.2, Step 11. Do not run the battery connector labeled K1 (P) through the hole. This plugs into the battery pack assembly that is installed later. See Figure 7.

13. Install the four foot assemblies (Q) into the four standoffs (O). See Figure 7.

14. Turn the scale base right side up.

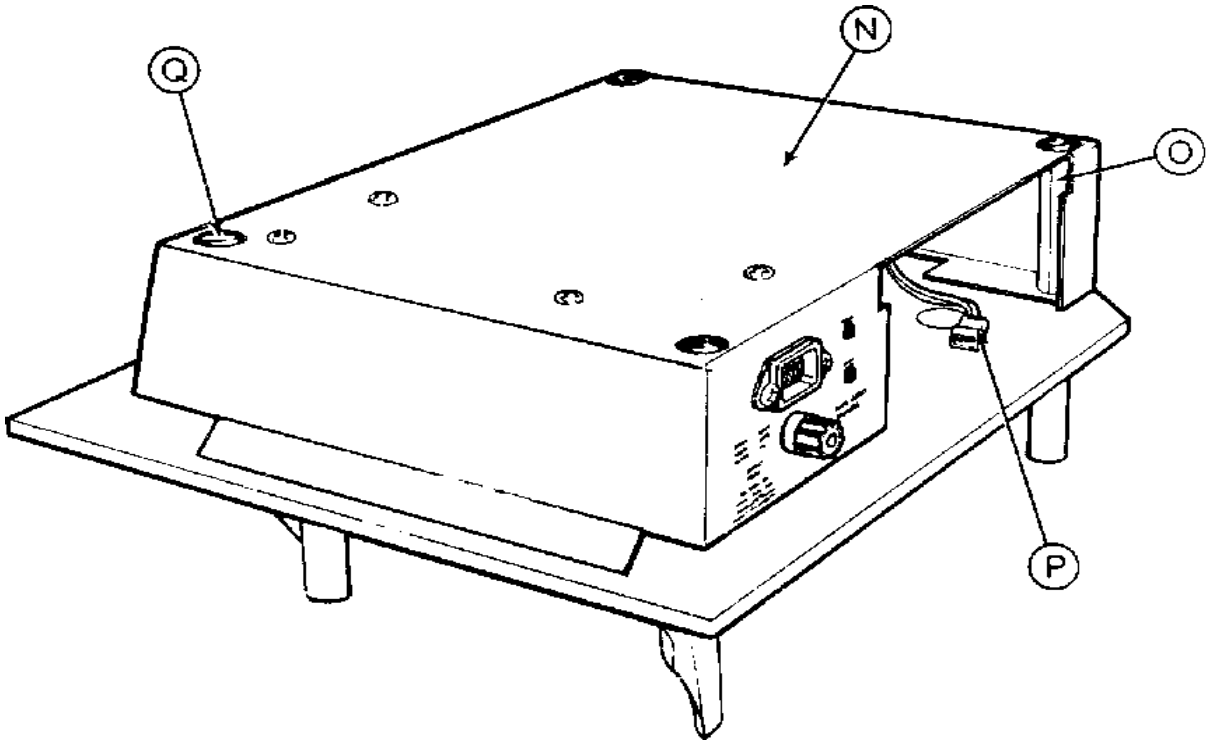
15. Remove the black and gray wires from the ON/OFF switch SW1 (R) terminals 1 and 1a. Also remove the white wire from switch SW1 (R) terminal 2a. See Figure 2.

16. Connect harness (*) 126970 00A to SW1 at terminals 1 (labeled SW1-1) and 1a (labeled SW1- 1A) (R). See Figure 2.

17. On harness (*) 126952 00A plug connector (S) (labeled J4A) into the connector labeled P4A that was removed from the Logic board in Section 5.1, Step 4. See Figure 2.

18. Remove the male plug cap from the white wire labeled E6 on the transformer harness (*) 125676 00A and connect this wire to the white wire labeled E8 (T) from harness (*) 126969 00A. Connect the black wire labeled E9 (U) from harness (*) 126969 00A to the black wire labeled E7 from transformer harness (*) 125676 00A. See Figure 2.

FIGURE 7



19. Using the 8-32 X 3/8″ screw provided in the kit, secure the ring terminal (labeled GND) (V) of harness (*)126969 00A to the scale base. See Figure 2.

20. Connect plug from harness labeled P4 (W) (*) 126953 00A from J8 on Charger board to J4 on the Logic board and plug connector labeled PY to the +20V test pin. Reconnect the load cell harness to PJ5. See Figure 2.

21. Refer to Figure 2. Remove the two screws holding the load cell cover (X). Lift the load cell cover and place the spacer block (which was removed in Section 5.1, Step 5) on top of the load cell. Make sure that the holes in the spacer block are aligned with the holed in the top of the load cell. Attach the load cell cover using the four screws removed in Section 5.1, Step 5.

(*) - May have revision level.

22. Install the scale cover(s) using the same screws that were removed in Section 5.1, Step 3.

CAUTION: If the 8581 Parts Counter is a 5 pound capacity of less, perform stop 2.1 under the Caution Note just after Section 5.1, Step 2 of this procedure before proceeding with Step 23. Perform Step 2.2 after completing step 23.

23. Install the sub-platter and tighten the screws according to the label on the sub-platter.

24. Install the platter and level the scale.

25. Install the battery pack assembly by plugging connections P1 (P) to J1 of the battery pack and securing the battery pack assembly to the chassis with the four screws provided in the kit. See Figure 7.

26. Refer to the 8581 technical manual, TM 008581 IO(*), [(*)126994 00A] for start up procedures and correct operation.

(*) - May have revision level.

6. OPERATING INSTRUCTIONS

6.1 DISPLAYS

There are three (3) displays on a Model 8581. They are labeled ‘‘Weight,’’ ‘‘Count’’ and ‘‘Data.’’ The displays are green-blue, vacuum fluorescent, five or six digits with lighted decimal points. All digits are 0.5’’ in height. Over capacity in weight display is a indicated by blanking of the display at five increments over rated scale capacity. Under zero is indicated by blanking the display with a minus sign showing at five increments under gross zero.

The ‘‘Weight’’ display continuously shows either gross or net weight. The ‘‘Count’’ display will show actual count, accumulated count, or consecutive number. The ‘Data’’ display may display tare weight, average piece weight, I.D. or calculated percent accuracy.

6.2 DISPLAY LEGENDS

The legends are printed on the display lens and are indicated by lighted descriptors directly above each legend.

LB: The LB legend is illuminated when motion has ceased and the LB mode has been selected.

KG: The KG legend is illuminated when motion has ceased and the KG mode has been selected.

G: The G legend is illuminated when motion has ceased and G mode has been selected.

ZERO: Zero will be illuminated when the instrument is within + 0.25 increment of the center of the zero increment.

NET: The NET legend, when illuminated, indicates tare has been selected.

SAMPLE: The sample legend will flash when an insufficient sample has been entered by the operator. At this time the ‘‘Count’’ display will show ‘‘Add n’’ with n being the number of pieces to add to meet minimum sample weight.

CN: The CN legend will be illuminated when a consecutive number is shown on the three most significant digits of the ‘‘Count’’ display. NOTE: Consecutive number will advance only when ‘‘Count’’ is illuminated.

TOTAL: The total legend is illuminated when an accumulated count is displayed in the ‘‘Count’’ display. It also flashes when an entry into accumulation is made via the pushbutton.

‘‘ACCUM’’ pushbutton.

TARE: The Tare legend, when illuminated, indicates that tare weight is being displayed on the ‘‘Data display.

APW: The APW legend will be illuminated upon power-up and anytime the average piece weight is displayed in the ‘‘Data’’ display.

ID: The ID legend will be illuminated anytime the six most significant digits of the currently selected ID are recalled to the ‘‘Data’’ display.

% ACCY: The % ACCY legend is illuminated when the current calculated percent accuracy is recalled to the ‘‘Data’’ display.

6.3 KEYBOARD

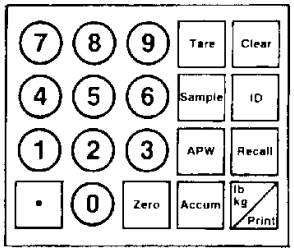


Figure 5

DIGITS 0-9 and.: Used to enter numeric data when required as in keyboard tare, average piece weight (APW), ID, etc. Corresponding digits are echoed on the Data display.

.: Depressing and holding the decimal (.) pushbutton while applying power via the ON/OFF switch will allow the operator to gain access to the programming of the 7 operational functions (F1.2 through F1.8).

ZERO: Provides the ability to rezero the scale over range of 4% of the programmed full scale capacity. Also, when a count is displayed and tare weight has been entered, depressing the Zero key results in the weight display switching to gross weight for approximately 2 seconds and then returning to net.

TARE:

PUSHBUTTON TARE: When the Tare button is pressed with weight on the scale, and no weight motion present, the tare weight will be subtracted from the gross weight to provide a net weight display of zero. If the weight is removed from the scale, the net weight will be displayed as a negative value.

KEYBOARD TARE: The instrument is equipped with a keyboard to provide a means of entering tare weight. Digital tare up to full scale capacity can be entered. The number entered is displayed on the Data display. When the Tare button is pushed, the entered weight is subtracted from the gross weight on the platform and net weight is displayed in weight display. The least significant digit is always rounded up or down to agree with the weighing increment, i.e. 0, 2, 4, 6, 8 for X2 increments and 0 or 5 for X% increments. If the tare operation results in a 5 digit negative net weight display, the weight

CLEAR: When entering any data, a single depression of the Clear key will erase the data entered; a double depression will exit the data entry mode. When not in a counting sequence (no sample or APW has been entered) a single depressing of the clear key clears any tare weight that has been entered, returning the weight display to Gross Mode. During a counting sequence a double depression of the ''Clear'' key exits the counting mode and clears tare weight, APW, and ID.

SAMPLE: The Sample key is used to terminate the entry of sample piece count, and put the scale into count mode. If the sample is less than the minimum required to calculate a

rough APW, the count display will show ‘‘LO’’ for 2 seconds and then clear. The operator should place additional pieces (or remove pieces on count out sequences) on the platter and re-enter the sample count. If the scale can calculate a rough APW but has not reached t he selected minimum sample weight, the count display will show ‘‘Add n’’ where ‘‘n’’ is the number of pieces that need to be added to reach the minimum sample weight. If set up switch [F2.3 ON] (Section 4.2) is on, the scale will sense the weight increase and automatically recalculate the APW and display the count. If switch [F2.3] is off, the operator must add the exact “ n” pieces and depress the sample key to advance the scale to count mode.

ID: The ID key is used to terminate the entry of a numeric ID number. The field is 12 digits maximum and as the data is entered, the data display will scroll to the left. The 8581 can store a maximum of 20 ID values at any one time.

APW: The APW key terminates the entry of average piece weight. The field is 6 digits maximum, plus decimal point. The scale will calculate count based on the entered APW or, as selected during set up, an entry of pieces per pound or kilogram). See Section 4.2 ([F2.3 ON]). Percent accuracy display is disabled when APW is entered manually.

With the scale at Gross Zero, depressions of the Accum key will first display the 6 least significant digits of the accumulator value, and the next depression will display the 2 most significant digits and the three digit consecutive number. The Clear key aborts this sequence.

lb/kg - PRINT: When the scale is at Gross Zero, depressions of the key result in switching the weight display from avoirdupois to metric indication or the reverse.

Note: Lb/kg function is disabled on 8581 XR (factory numbers 8381-2001, 2002)

When the scale is above gross zero, in count mode, or with tare weight entered, this key initiates data output. Format and baud rate are selectable in set up.

6.4 INITIAL POWERUP SEQUENCE

When power is first applied to the scale (via the power switch on the right side of the base near the front) the following sequence will occur.

The displays show all ‘‘8’’ ‘s with all cursors illuminated for two seconds and then blank.

The displays will then show all ‘‘.’’ (decimal points) for two seconds and then blank.

The next display indicates the software part number and revision number,
[122681 L0X], the (X) is the software revision level, L07 or higher will be displayed for an ‘‘F’’ revision or higher Logic PCB.

While the software part number is being displayed internal hardware tests are initiated by the 8581. Ram and Rom checks are performed as well as communication with the DigiTOL ™ load cell.

If error message [E4], novram checksum error occurs, setup must be entered and stored to calculate a new setup checksum value.

The last step of the powerup sequence is the capturing of zero. If the weight indication is within 2% of scale capacity, zero will automatically be captured by the 8581. If outside the zero capture range, the weight display will show [- - - - -] until the zero is manually captured.

6.5 OPERATING SEQUENCES

1. Counting Operation

Normal Sample Mode

Step 1: Place empty container on platter, press ''TARE''.

Step 2: Place sample pieces on platter, enter number of pieces, press ''SAMPLE''.

Step 3: Add pieces to container, count is displayed.

Normal Sample with Keyboard Tare

Step 1: Place sample pieces on platter, enter number of pieces, press 'SAMPLE''.

Step 2: Enter Tare Weight of container via keyboard, press ''TARE''.

Step 3: Add pieces to container, count is displayed.

Count Out Sequence

Step 1: Place full container on scale, press ''TARE''.

Step 2: Withdraw sample pieces, enter number and press ''SAMPLE''

Step 3: As additional pieces are removed, count of pieces withdrawn is displayed.

Sample Take Out Sequence

Step 1: Place the full container on the scale, press ''TARE''.

Step 2: Withdraw the sample and enter number, then press ''SAMPLE''.

Step 3: Enter the container tare weight via the keyboard, followed by ''TARE''. (This tare overrides the previous tare entry).

Step 4: Count is then displayed.

2. Counting Weight Range Parameters

Four distinct zones of counting exist in relation to the weight on the platter. Set up section [F1.7 ON] Average Piece Weight Enhancement is disabled zone 3 below does not exist.

Zone	Weight	Condition
1	Below Minimum APW Computation (below 0.02% of full scale).	No sampling. Display shows weight and selected data field.
2	0.02% Full Scale to Minimum Sample Weight.	Sampling allowed. Display shows weight and selected data field.
3	Minimum Sample Weight to 4%. Print and Accumulation allowed.	Count Mode. APW Enhancement allowed. Display shows weight, count, and selected data field.
4	4% to Scale Capacity. Print and Accumulation allowed.	Normal Counting Mode. No enhancement. Display shows weight, count, and selected field.

a). Below Minimum APW Computation Zone

Average Piece Weight (APW) cannot be accurately computed below 0.02% full scale. Any attempt to enter a sample piece count and press the 'SAMPLE' key will result in the message 'LO' in the count display for two seconds. The operator should add samples until the 'LO' message does not result. The sample piece count may now be entered and the 'SAMPLE' key pressed.

b). 0.02% Full Scale to Minimum Sample Weight Zone

Under Set up Control, the 8581 can be set up to permit the operator to continuously update the average piece weight based on larger and larger samples. A minimum APW weight as defined above is required for initial calculation of APW. As additional pieces are placed on the scale, each time the scale sees a 'motion/no motion' sequence, a new APW is calculated, based upon the new total sample weight with the sample count calculated using the APW previously established. See Section 5, Part E for further discussion of APW. Minimum Sample weight is selected during Set up as 0.02%, 0.05%, 0.1%, 0.2% of scale capacity. The display shows 'Add (n)', when Sample weight is below the minimum selected. (n) is calculated by using the original sample to calculate an APW, and using this APW to calculate the maximum number of pieces allowed which will permit enhancement of the APW. If this maximum is exceeded, 'OVER' will be displayed in the Count display and the operator should remove parts until a motion/nomotion sequence does not result in the 'OVER' display. A manual sample acceptance mode is also selectable in the set up mode which requires an exact number of samples ('n') be added and the 'SAMPLE' key pressed. This results in the most accurate APW.

c). May Enhance Counting Zone

From the Minimum Sample Weight to 4% of scale capacity the scale is in full counting mode. Printing and accumulation may be done as desired. The APW will be enhanced throughout this range, unless too many pieces are added to the platter. If the count of pieces added exceeds the number which can be reliably counted using the previous APW, the display shows 'OVER' for 2 seconds, after which the count is again displayed. If the operator wishes to continue APW enhancement the must remove pieces until each ''motion/no-motion" sequence no longer results in an 'OVER' display. APW enhancement then occurs.

If the operator ignores the 'OVER' display and adds more pieces, prints or accumulates, no further APW enhancement is possible for the current transaction. Once the counting weight reaches 4% of scale capacity. APW enhancement is discontinued.

d). Normal Counting Zone

From 4% to 100% of scale capacity is the normal counting zone, during which the displayed APW will not change and no APW enhancement is done.

6.6 AVERAGE PIECE WEIGHT ENHANCEMENT

The initial computed value of Average Piece Weight (APW) may not have the accuracy needed to reliably count large numbers of small pieces. This problem is inherent in a single scale parts counter, since it must have the weighing range to count large quantities for up to 4% of scale capacity. In order to ensure a minimum APW initial accuracy, a minimum sample weight of 0.02% full scale is required.

APW enhancement is based on the fact that an accurate APW, while not able to count large numbers of parts, will very reliably count a small number of pieces.
This count will then allow a new determination of APW based on a large weight. Given enough enhancements the APW will become very accurate.

Enhancement occurs on a ''motion/no-motion" sequence with the following two conditions satisfied:

a). Pieces must have been added (i.e. the weight must have increased).

b). The pieces added must not exceed the amount which can be counted accurately with the current APW. A display of ''over'' results when this amount is exceeded.

6.7 ACCUMULATION

1. Storage

Piece counts may be accumulated by ID number, to a total of 21 ID numbers, including ID 0, when no ID number is

entered. Each accumulator includes 8 digits for total count, and 3 digits for number of transactions. The transaction accumulator is a counter which increments once for each transaction via depression of the ACCUM key.

2. Accumulator Display

Accumulator contents are displayed by entering the ID number, the ID key, and the ACCUM key, when the scale is at Gross zero and not in the count Mode. Accumulator contents of the current ID are displayed by pressing the ID key and Accum key without first entering an ID.

The least 6 significant digits of the accumulated count will be displayed in the Count display and the Total flag lighted.

Pressing the ACCUM key again causes the two most significant digits of the accumulator contents to be displayed in the right 2 digit positions, the consecutive number is displayed in the 3 left hand digit positions of the count display, and the CN flag is lighted. The ID number continues to be displayed in the Data display field, and the weight display is blanked when the accumulator display is aborted.

NOTE: The Model 8581 does not include battery backed RAM memory. Therefore, accumulator contents will be cleared and lost when power is removed from the scale or the power switch is moved to the ''Off'' position.

3. Accumulator Printing and Clearing

An accumulator which is displayed may be cleared by pressing the PRINT key, whether or not a printer is connected, followed within 5 seconds by the ZERO key. If the Zero Key is not pressed within the 5 second time frame, the total will not be cleared. Use of the CLEAR key at this time returns the scale to the ''Ready'' state.

6.8 TEMPORARILY CHANGING OPERATIONAL FUNCTIONS

When changing programming of Operational Functions, (Step F1.2 through F1.8) set up Step switch. Depress and hold the decimal point pushbutton and apply power. When the scale enters its display power up sequence, release the pushbutton. When the display sequence is complete, the display will then show F1.2. Reprogram the necessary functions in the normal manner (refer to Section 4.2). Upon completion of reprogramming, the display will switch to zero and the 8581 is ready for operation. To return to the original programming parameters, perform a power down/power up sequence.

7. PREVENTIVE MAINTENANCE

The Model 8581 is designed to require a minimum of maintenance and service. This section provides instructions and procedures for maintenance of this unit, as well as a troubleshooting guide to aid in problem analysis.

It is suggested that assistance from Toledo Scale service personnel be requested in the event a problem should arise that is beyond the scope of this technical manual.

7.1 REQUIRED TOOLS AND SUPPLIES

The following items are recommended for maintenance and repairs of the unit. Common hand tools are also required:

Volt- Ohm Meter
Static Control Work Station
Static Bags (P/N 112736 00B)
Cleaning Cloth

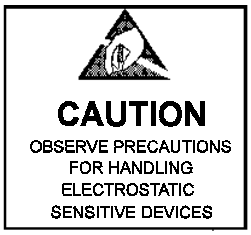
7.2 MAINTENANCE SCHEDULE

In normal clean environmental conditions the frequency for normal maintenance (cleaning and inspection) is twice a year.

7.3 CLEANING

Clean the keyboard and cover with a soft clean cloth that has been dampened with a mild window type cleaner (DO NOT SUE ANY TYPE OF INDUSTRIAL SOLVENT). DO NOT SPRAY CLEANER DIRECTLY ONTO THE UNIT.

7.4 TROUBLESHOOTING



1. If operational difficulties are encountered, obtain as much information as possible procedure.

2 Check fuses, primary power lines, external circuit elements and related wiring causes such as loose or improper circuits, power supply connections or fuse failure.

3. Use the electrical interconnecting diagram as an aid to locating trouble causes. This diagram contains various voltage measurements that are averaged for normal operation.

Use instrument probes carefully to avoid causing short circuits and damaging circuit components.

4. A printed circuit board believed to be defective may be checked by replacing it with a known good PCB, and then observing whether the problem is corrected. WHEN HANDLING A PCB, USE A STATIC BAG FOR BOTH THE NEW AND DEFECTIVE PCB. When replacing a suspected faulty PCB, do not program the replacement PCB from the original one as the malfunction may be caused by a programming error. Use the proper technical manual to determine in what position the switches and/or jumpers should be.

CAUTION: Always check power supply voltages before replacing any PCB's. Failure to observe this precaution could result in damaged replacement PCB's. Refer to Section 6. for voltage check procedures.

CAUTION: When replacing the load cell or any one of the PCB's. Remove power from the scale and wait a minimum of 30 seconds before removing any harness, as damage will result.

5. To verify the problem, as being in the removed PCB, reinstall the defective PCB and retest. This test will eliminate the possibility of having replaced a good PCB because of a loose or poor connection. Exchange PCB's, or sub-assemblies are available from your authorized Toledo Scale representative.

6. Error Codes

Chart 4

ERROR CODE	DESCRIPTION	CORRECTIVE MEASURE
E1 Error	Prom Checksum	1. Power Down/ Wait/ Power Up 2. Replace Main PC
E2 Error	Internal Ram	1. Power Down/ Wait/ Power Up 2. Replace Main PCB

E3 Nov Ram Shadow Ram Error	1. Power Down/ Wait/ Power Up 2. Replace Main PCB
E4 Nov Ram Checksum Error	1. Power Down/ Wait/ Power Up 2. Reprogram/Recalibrate 3. Replace Main PCB
E5 External Ram Error	1. Power Down/ Wait/ Power Up 2. Replace Ram Expander PCB 3. Replace Main PCB
E6 Load Cell Data Format Error	1. Recalibrate/ Reconfigure 2. Replace :pad Cell
E7 Load Cell No Data Error	1. Check 20V Supply 2. Replace Load Cell
E8 Load Cell Out of Range Error	1. Check 20V Supply 2. Replace Load Cell
E9 Load Cell Download Error	1. Recalibrate 2. Replace Load Cell
E10 Scale Build Error	1. Reconfigure and Calibrate
E11 Span Calibration Error	1. Reconfigure and Calibrate 2. Replace Load Cell
E20 Piece Count Out of Range	1. Remove Pieces until Error Message Disappears
E31 Accumulator File Entry Not Found	1. Check Correct ID Entry 2. Re-enter ID
Full Accumulator file Full	1. Clear Individual Accumulator

NEW ERROR CODES: For 8581's with F revision PCB's or newer (revision L07 or higher on power up display).

ERROR CODE DESCRIPTION	CORRECTIVE MEASURE
E12 Test weight greater than capacity entered during calibration..	Check capacity programming and recalibrate scale.
E13 Zero test weight entered during calibration.	Recalibrate scale.
E21 Invalid build error.	Select valid capacity from Chart # 3 and recalibrate.
E22 Math overflow error setup memory corrupted.	Math overflow error. This error will occur if linearity adjust is turned on, (SETUP step [F2.10 ON]), and scale is not recalibrated. To clear error, reprogram and recalibrate.

7.5 TESTING THE OPERATIONAL VOLTAGES

CAUTION: When removing the platter support assembly, slowly remove the two mounting screws first, then the platter support, to insure that the load cell RFI cover does not tear.

NOTE: When installing the subplatter of the 3000 g capacity 8581 XR, carefully center the subplatter overload setscrews over the overload stops built into the base. Tighten the subplatter mounting screws to the recommended 75 to 85 in/lb torque, and verify the overload stops engage as detailed in section 8.2.

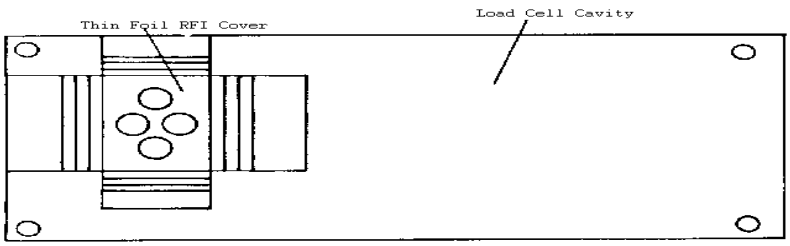


Figure 6

1. Power Supply Voltages

Transformer voltage measurements should be taken at PJ-3 on the Main Logic PCB. All voltages are AC voltages and are approximate.

Chart 5

PJ-3 PINS	AC VOLTAGE	SUPPLIES VOLTAGE FOR..
5 & 6	10 VAC	5 VDC Regulation 10 VDC Supply
2 & 3	20 VAC	20 VDC Supply for Load Cell
2 & 8	50 VAC	Display Voltage

2. Logic PCB Voltages

Logic PCB voltage measurements are taken at the designated test points on the PCB. Refer to Figure 7 for test point locations.

Chart 6

TEST POINT	VOLTAGE SPEC.
TP1	GROUND
TP2	+10 VDC
TP3	+60 VDC
TP4	+ 20 VDC
TP5	+5 VDC ± 0.2 VDC

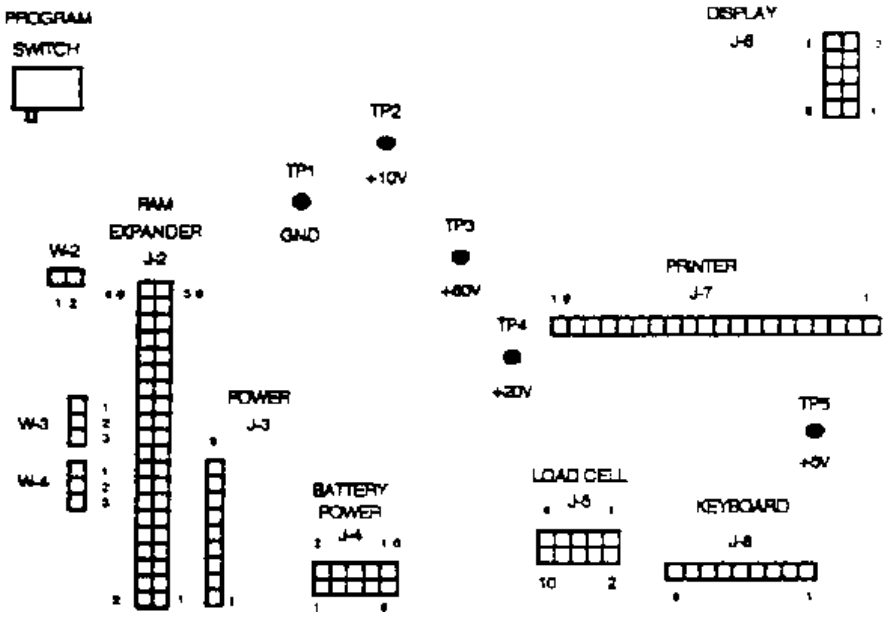


Figure 7

3. Testing Battery KOP Voltages

When testing the battery option for a problem, first verify scale operation with AC power applied. If the 8581 operates properly with AC power applied then check the battery voltage as follows.

First remove AC power to the 8581. Next disconnect the battery pack plug P9 from the J9 connector on the Battery Charger/Inverted PCB.

Measure the battery voltage across pins 1 and 2 of the battery pack plug 9. The voltage must measure 11.9 VDC or higher.

If a battery voltage of zero is measured then check for a blown internal 4 A fuse located inside the battery pack. Make sure this fuse is of the correct amperage rafting.

If the battery voltage is less than 11.9 VDC, then the batteries in the battery pack are bad and must be replaced. Both batteries in the battery pack must be replaced at the same time to ensure an equal charge in both batteries.

If the battery voltage checks out ok then verify that the Battery Charger/Inverter PCB output voltages are present.

Chart 7

PJ-4 PIN	PJ-4 TO PIN	VOLTAGE READING
7	3	9VDC
7	10	53 VDC
7	20 V Test Point On Main PCB	20 VDC

4. Testing the 20 mA Current Loop

This test can be performed at either the printer end of the interconnect cable, or at the printer output plug (J-10). Set your meter to read DC milliamps.

After determining which printer is being used, refer to the following chart by printer Model Number to determine where to connect your metal leads. After connecting your meter leads to the proper cable pins your meter should show from 18.0 to 40.0 milliamps. Depress the 'print' key on the 8581 keyboard, and observe the meter reading. The reading should fluctuate to half the original meter reading, which indicates there is a transmission, then return to the original meter reading. The reading should fluctuate to half the original meter reading, which indicates there is a transmission, then return to the original meter reading.

When testing the output at J-10 (the 8581 printer port), hook your red lead to Pin 9 and your black lead to Pin 22, and perform the same test.

Chart 8

MODEL NUMBER	PLACE RED LEAD ON PIN # 20 mA RECEIVE +	PLACE BLACK LEAD ON PIN # 20 mA RECEIVE-
307	6	7
8804* 8806 8860*	16	18
8855	3	22

* Requires adapter plug loop. Loop test is taken at printer end of adapter plug with adapter still connected to cable.

8. DATA OUTPUT

Data Output is via 20 mA current Loop, ASCII coded. Baud rate is selectable at 300, 1200, 2400, 4800, and 9600 baud, even parity.

8.1 SINGLE LINE FORMAT

The 8581 Parts Counter is capable of sending up to 82 characters of information in single line format. Depending upon which printer is being used, it will be necessary to choose which data fields can be printed. Refer to the Single Line Data Output Table (Section 7.4) for information on the size of each data field. The following is a list of Toledo Scale printers and the amount of characters they are capable of printing on a single line.

Chart 9

307	30 Characters per Line
8804	40 Character per Line
8804	40 Characters per Line
8840	72 Characters per Line
8855	40 characters per Line

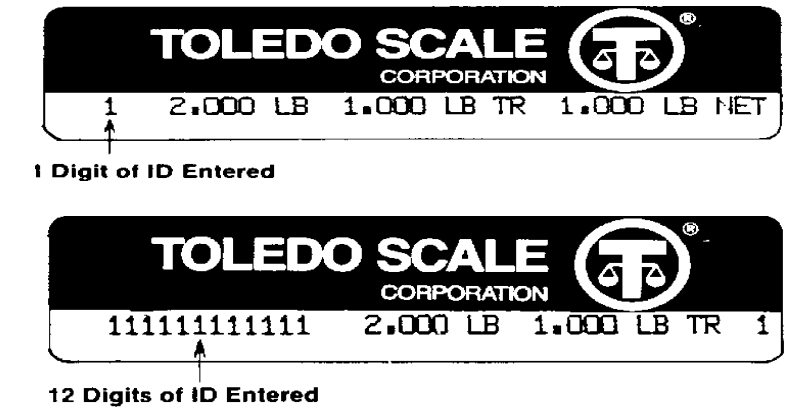
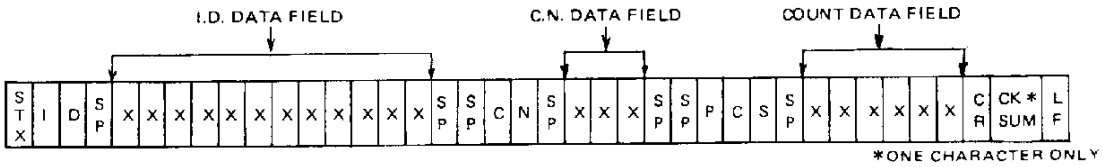


Figure 8



There are 3 fields of data that are variable in length (ID, CN, COUNT). These fields will vary the length of the printout depending on the amount of characters being printed in these fields. Some examples of what will happen when these fields are not taken in to account are shown in Figure 8.

8.2 MULTI-LINE OUTPUT

Any or all of the possible 7 print fields may be selected to print in a multiple line format. See the Multiple Line Data Output Table (Section 7.5) for field lengths.

8.3 ACCUMULATOR DATA PRINT FORMAT

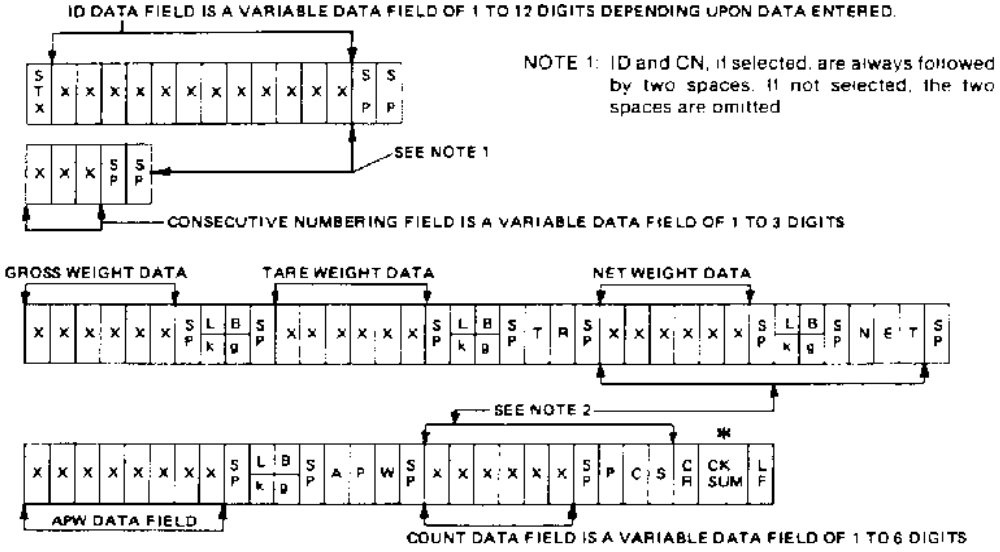
Data output occurs when the print button is pressed while the accumulator data is displayed. Formatting is single line and the three fields are variable length, the length of the field being dependent on the number of characters entered.

NOTE: All fields print whether they are programmed to or not.

8.4 SINGLE LINE DATA OUTPUT

(All Baud Rates)
ALL DATA SENT IS 11 BIT ASCII (1 START BIT, 7 DATA BITS, EVEN PARITY BIT, 2 STOP BITS)

DATA IS SENT ONCE EACH TIME PRINT IS INITIATED.



NOTE: When Net Weight and/or Count Field is programmed to print double width, the Data Field is preceded by the ASCII character SO (Shift Out), and followed by the ASCII character SI (Shift In) to return to normal size print.

Figure 9

8.5 MULTIPLE LINE DATA OUTPUT

ALL DATA SENT IS 11 BIT ASCII (1 START BIT, 7 DATA BITS, 1 EVEN PARITY BIT, 2 STOP BITS)
DATA IS SENT ONCE EACH TIME PRINT IS INITIATED.

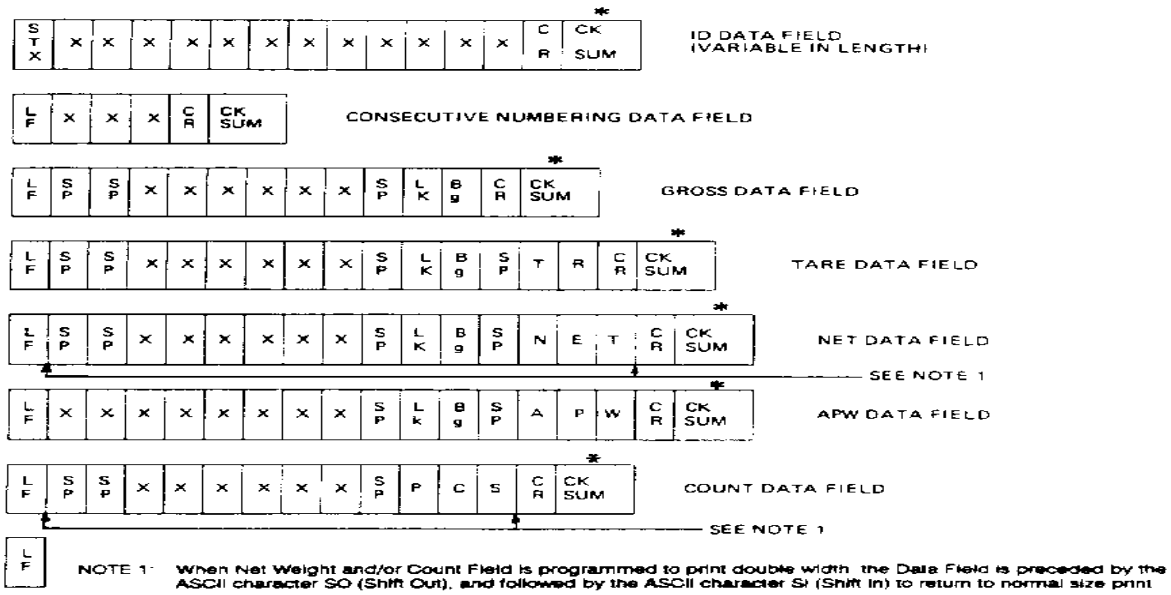


Figure 10

8.6 INPUT/OUTPUT CONNECTIONS

1. Printer Output

Chart 10

Signal Name	8581 J10	307-J9	8860* 8804-*	8806-J	8855-J1
Logic GND	7				
Receive +20 mA	8				
Transmit + 20 mA Active	9	6	16	16	3
Receive - 20 mA	10				
Receive Current Source	13				
Logic GND	19				
Transmit -20mA Active	22	7	18	18	22
Logic GND	23				

* The 8804 and 8860 require and Adapter Plug for interfacing.

RS232-C OUTPUT PIN DESIGNATIONS (J-10)

Chart 11

J-10 PIN	DESCRIPTION	8842**
1	Ground (Chassis)	
2	Transmit Data (T x D)	3
3	Receive Data (R x D)	
7	Signal Ground	7

NOTE: This KOP precludes use of the 20 mA output. When this KOP is installed, the 20 mA output is no longer available.

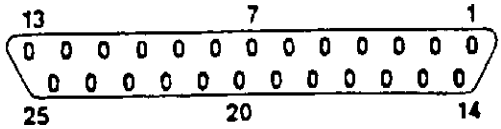
** 8581 requires an RS-232 KOP to work with the 8842 Printer.

A TYPICAL RS232-C INTERFACE IS AS FOLLOWS:

```
            MODEL 8581                                  PRINTER
                  PIN                                       PIN

      T X D       2-----------------------------------------------------------
---------3  R X D
      GND         7-----------------------------------------------------------
---------7  GND
```

J-10 SERIAL I/O



25 PIN CONNECTOR VIEWED FROM REAR OF INSTRUMENT.
CONNECTOR IS SHOWN TO AID IN PIN NUMBER IDENTIFICATION.

Figure 11

2. Printer Interconnect Cables

Chart 12

MODEL	LENGTH	PART NO.	SALES NO.
307	6′ 20′	A 119714 00A A110715 00A	0900-0191 0900-0199
8804* 8860* 8806	6′ 20′	115544 00A 115545 00A	0900-0136 0900-0137
8842**	6′	128220 00A	0900-0214
8855	6′ 20′	A119722 00A A119723 00A	0900-0917 0900-0916

* The 8804 and 8860 require an Adapter Plug for interfacing.

** The 8581 requires and RS-232 K.O.P. to work with the 8842 Printer.

9. PARTS REPLACEMENT

CAUTION: When replacing the load cell or any one of the PCB’s. Remove power from the scale and wait a minimum of 30 seconds before removing any harness, as damage will result.

9.1 REPLACING THE LOAD CELL

1. Remove power from the scale. If a battery KOP is installed it must be removed to access the load cell.

NOTE: On 8581-1001, 1002 utilizing the 3.75 kg load cell, reinstall the two 8-32 shipping screws through the sub-platter into the two hex standoffs. See Figure 1, Section 4.1. Do not tighten these screws

down. They are used to keep the sub-platter from twisting while tightening or loosening the two load cell screws. DAMAGE MAY RESULT IF THIS PROCEDURE IS NOT FOLLOWED. After loosening or tightening the load cell screw, the two 8-32 screws may be removed.

2. Remove the platter, sub-platter, and cover assemblies.

CAUTION: When removing the platter support assembly, slowly remove the two mounting screws first, then the platter support, to insure that the load cell RFI cover does not tear. Refer to Section 6.5, Figure 6.

3. Remove the load cell cavity cover and the spacer block which sits on the receiver of the load cell.

4. Turn scale upside down, remove the two Hex head screws and allow the load cell to drop. Be sure to retrieve the bottom spacer. (See Figure 12).

5. Stand the scale base on its side, insert the retaining screws through the bottom holes and slide the bottom spacer over the screws.

6. Carefully install the load cell by re-screwing the screws into the bottom of the load cell, tighten screws to 75 to 85 inch/pounds.

7. Stand scale base upright and re-install top load cell spacer ad cavity cover.

8. Re-install all harnesses, top cover, subplatter, and platter.

NOTE: When installing the subplatter of the 300 g capacity 8581 XR, carefully center the subplatter overload setscrews over the overload stops built into the base. Tighten the subplatter mounting screws to the recommended 75 to 85 in/lb torque, and verify the overload stops engage as detailed in section 8.2.

NOTE: When replacing a digital load cell in the 8581 the revision level of the Logic PCB part number * 122783 00A must be checked. The ‘‘C’’ revision or older Logic PCB’s are not compatible with CMOS digital load cells. If the revision level is no a ‘‘D’’ or newer then a Kit of Parts, part number A131929 00A (Factory Number 0901-0250) must be installed in the Logic PCB to update the Logic PCB to a revision that is compatible with both the Universal and CMOS digital load cells. (*) May have a letter prefix.

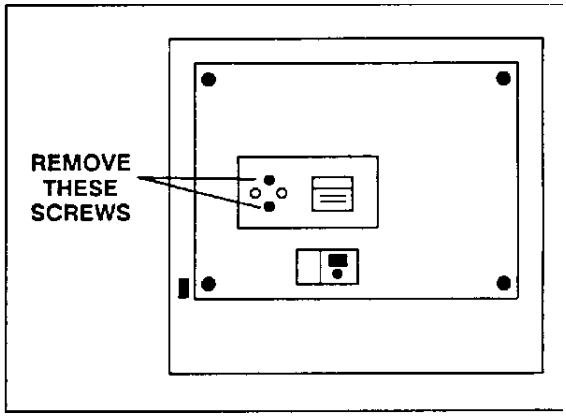


Figure 12

9.2 OVERLOAD

STOPS

1. 8581 XR Overload stop location

The 8581 XR requires that the load cell overload stop(s) be adjusted with great care to ensure proper overload protection for the load cell. Refer to the following instructions to test and adjust overload stops.

CAUTION: Exercise caution when adjusting the load cell overload stops on the 8581 XR (factory number 8581-2001, 8581-2002). Improper adjustment may result in damage to the load cell.

The 600 g capacity 8581 XR has one over load stop located directly under the load cell, (refer to figure 13 for load cell overload stop location).

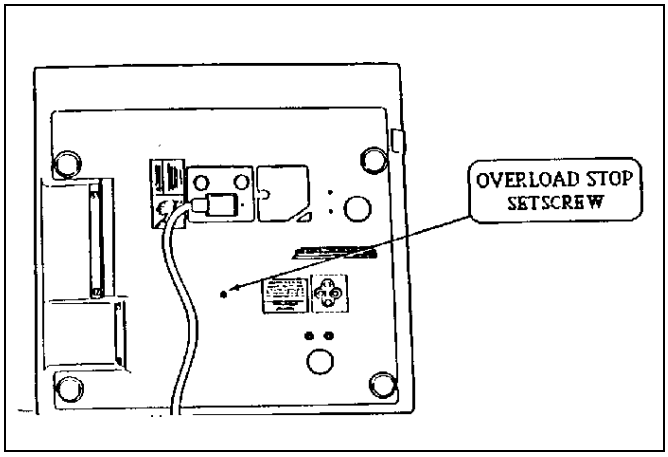


Figure 13 - Load Cell, Overload Stop, Setscrew Location

The 300 g capacity 8581 XR has one overload stop located directly under the load cell, (refer to Figure 13 for load cell overload stop location) and two overload stops built into the subplatter assembly, (refer to Figure 14 for subplatter overload stop locations).

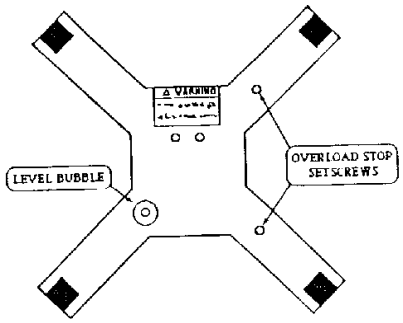


Figure 14 - Setscrew Lo

Place the 8581 into expanded weight display mode, (SETUP step [F3.1 ON]).

The 600 capacity 8581 XR, (factory number 8581-2001), overload stop adjustment must be made with a one kg test

weight. When the overload stop is correctly adjusted a one kg weight placed on the center of the scale platform displays an expanded weight display counts.

The 3000 g capacity 8581 XR, (factory number 8581-2002), overload stop adjustments must be made with a five kg test weight. When the overload stops are correctly adjusted a five kg weight placed on the center of the platter, and then placed directly over each of the subplatter overload stops in turn, (refer to Figure 2 for the subplatter overload stop locations), displays an expanded weight reading for each of the overload stops, within the range of 350,000 to 400,000 expanded weight display counts.

If the weight display is within the proper range of expanded weight display counts, for the capacity 8581 being checked, then the overload stop setscrew is correctly adjusted. DO NOT adjust an overload setscrew unless the weight display is reading above or below the range of expanded display counts listed when the test weight is placed over that overload stop.

3. Load cell overload stop adjustment for both 600 g and 3000 g capacity 8581 XRs.

Place the 8581 into the expanded weight display mode, (SETUP step [F3.1 ON]) and remove the scale platter.

Place the 8581 on 4 supports to elevate the scale and expose the load cell overload setscrew, (refer to Figure 13, for setscrew location).

Carefully, a little at a time, adjust the overload setscrew located under the load cell, clockwise if the expanded weight display was above and counterclockwise if under the range of acceptable expanded weight display. Make a setscrew adjustments of 1/16 of a turn at a time and observe the results before making any further adjustments. Continue the adjustments until the expanded weight display reading is within the proper range of expanded weight display counts, for the capacity of 8581 being adjusted.

NOTE: This is a very delicate adjustment and must be made with extreme caution. if the overload setscrew is adjusted clockwise too far, damage to the load cell may result.

4. 3000 g capacity 8581 XR Subplatter Overload Stop Adjustment

Place the 8581 into the expanded weight display mode, (SETUP step [F3.1 On]) and remove the scale platter.

Carefully adjust the incorrect overload setscrew 1/16 of a turn, clockwise if the expanded weight display was above 400,000 counterclockwise if the expanded weight display is within the range of 350,000 to 400,000 for both subplatter overload stop setscrews.

NOTE: This is a very delicate adjustment and must be made with extreme caution. If the overload setscrew is adjusted clockwise too far, damage to load cell may result.

Return the 8581 to the normal weight display mode, (SETUP step [F3.1 OFF]) and replace the scale platter.

Verify that the 3000 g capacity 8581 weighs correctly when a three kg test weight is placed, in turn, on all four corners of the scale platter.

If the three kg test weight does not weigh correctly on one of the corners, then repeat the subplattter adjustment procedure above for the subplatter overload stop setscrew towards the higher end of the expanded weight display range closer to 400,000 than to 350,000 expanded weight display corner test using the three kg test weight after the subplatter overload adjustment is completed.

5. All other 8581 Overload Stop Adjustment.

Adjusting the overload stops is required when the load cell and/or spider has been replaced. Refer to Figure 15 for overload stop positions. There can be up to six overload stops, identified as X1 thru X7. All 5 lb and 10 lb capacity scales use stops X1, X2 and X3. Overload stop X1 is located under the load cell on the 5 lb and 10 lb capacity scales. Refer to Figures 13 & 14 for locations. The 25 lb and greater capacity scales use stops X2 through X7, refer to Figure 15.

CAUTION: Never apply weight exceeding the capacity of the scale or shock load the scale if the overloads have not been set.

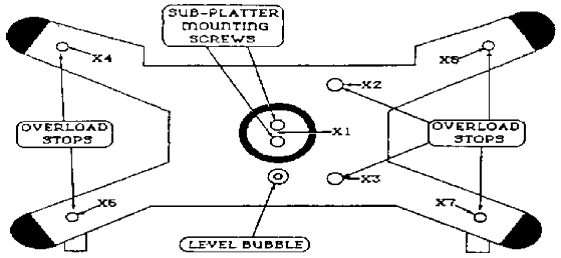


Figure 15

Procedure:

a). Assemble the base, load cell, and spider. Mounting screws should be snug but not tight.

Check that the corner and center overload stops are aligned with the overload adjust screws.

Tighten all four (4) load cell and spider mounting screws to 75/85 inch/pounds. Use a torque wrench to ensure proper screw tension without overtightening.

NOTE: All spider and cell mounting screws must be tightened to the proper specification as detailed in Step 8.2, #5. a.) before adjusting the overload stops. Failure to do so may result in the overloads being incorrectly set.

Chart 13 - Overload Adjustment

OVERLOAD	SCALE CAPACITY	WIRE GAUGE

STOP POSITION						MEASUREMENT TOLERANCE
	5 lb	10 lb	25 lb	50 lb	100 lb	
X1	6.5 lb	13 lb	N.A.	N.A.	N.A.	
X2	6 lb	12 lb	0.015/ #79	0.016/#78	0.024/#73	± 0.001 in
X3	6 lb	12 lb	0.017/#77	0.020/#76	0.026/#71	
X4	N.A.	N.A.	0.059/#53	0.084/#45	0.153/#24	
X5	N.A.	N.A.	0.064/#52	0.057/#54	0.094/#42	± 0.005 in
X6	N.A.	N.A.	0.059/#53	0.084/#45	0.153/#24	
X7	N.A.	N.A.	0.064/#52	0.057/#54	0.094/#42	

N.A. = NOT APPLICABLE

Note: The Overload stop gap measurements for overload stop positions X4, X5, X6, and X7 are listed both in inches and the wire drill bit number size equivalent.

Adjust the overload screws per Chart 13. The 5 lb and 10 lb capacity scales use instructions in Section 8.2.5.2. The 25 lb and greater capacity scales use instruction in Section 8.2, #.5. d).

b). With power applied, place the 5 lb or 10 lb capacity scales into expanded display mode and loosen overload stops X1, X2 and X3.

The test weight, refer to Chart 13 for correct weight, is placed in the center of the platter to adjust X1, the right rear corner to adjust position X2, and the right front corner to adjust position X3. Refer to Figure 14.

Place the test weight into position.

Tighten the overload screw until the display weight just starts to change. This shows that the overload screw has just touched the overload stop.

Repeat this procedure for each of the three overloads X1, X2, and X3.

c). The 25 lb and greater capacity scales overload stops are set by measuring the gap between the overload stop and screw and adjusting that gap until it meets the specification listed in chart 13. All dimensions are listed in inches. use round wire gauges, or wire drill bits listed, to measure the gap, do not use flat feeler gauges.

Tighten the overload screw until the gap is smaller than the wire gauge.

Hold the wire gauge, refer to Chart 13 for correct gauge, against the gap with a slight pressure.

Loosen the overload screw, slowly, until the wire gauge snaps through the gap.

Repeat this procedure for each of the six overloads X2, X3, X4, X5, X6, X7.

9.3 KEYBOARD REPLACEMENT

1. Remove power from the scale, if a battery Kit of Parts is installed, disconnect the battery.

CAUTION: When replacing the load cell or any one of the PCB's. Remove power from the scale and wait a minimum of 30 seconds before removing any harness, as damage will result.

2. Remove the platter, sub-platter, and cover assemblies.

CAUTION: When removing the platter support assembly, slowly remove the two mounting screws first, then the platter support to, to insure that the load cell RFI cover does not tear. Refer to Section 6.5, Figure 6.

3. Unplug keyboard ribbon connector from the Main PCB and gently slide the ribbon harness through the flat cable clamp (see Figure 16). Do not remove cable clamp.

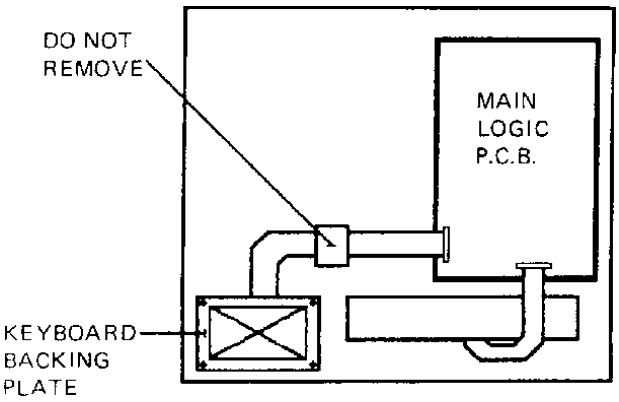


Figure 16

4. Remove the four retaining screws that hold the keyboard backing plate. Remove backing plate and keyboard assembly (see Figure 16).

5. Install the new keyboard assembly, backing plate, and four retaining screws.

6. Slide the ribbon harness back through the clamp. Make sure that the solid color side of the harness is installed towards the cover (striped side visible) (refer to Figure 16).

7. Re-install ribbon connector harness to J-8 on the Main PCB and test the operation.

9.4 PCB REPLACEMENT

CAUTION: When replacing the load cell or any on of the PCB's. Remove power from the scale and wait a minimum of 30 seconds before removing any harness, as damage will result.

1. Remove power from the scale. If a battery Kit of Parts is installed, disconnect the battery.

2. Remove the platter, sub-platter, and cover assemblies.

CAUTION: When removing the platter support assembly, slowly remove the two mounting screws first, then the platter support , to insure that the load cell RFI cover does not tear. Refer to Section 6.5, Figure 6.

3. Remove all harness connectors and retaining screws, then remove the PCB.

4. Remove the RAM PCB (Part No. 125670 00A) from J2 of the defective Main Logic PCB.

5. Insert PCB into a static bag (P/N 112736 00B) immediately.

6. Insert the Ram PCB (Part No. 125670 00A) into J2 of the replacement Main Logic PCB.

NOTE: When replacing the Logic PCB part number *122683 00A, the Ram Expander PCB part number *125670 00A, must be removed and installed in the replacement Logic PCB. Replacement Logic PCB's.
(*) May have a letter prefix.

7. Install new PCB making sure all jumpers are set correctly (see Section 4.3).

8. Re-install all harnesses, top cover, subplatter and platter.

NOTE: When installing the subplatter of the 3000 g capacity 8581 XR, carefully center the subplatter overload setscrews over the overload stops built in the base. Tighten the subplatter mounting screws to the recommended 75 to 85 in/lb torque, and verify the overload stops engage as detailed in section 8.2.

9.5 SPARE PARTS LISTING

*122683 00A Logic PCB
*122722 00A Display PCB
*125670 00A Ram Expander PCB
*126991 00A Keyboard Assembly
(See NOTE 1) Digital load Cell
(*) May have a letter prefix.

NOTE 1: Refer to the parts Catalog for the correct Load Cell Part number for your specific 8581 Factory number and capacity.

9.6 KIT OF PARTS LISTING

1. Battery Pack KOP
Service Part Number (*) 126960 00A
Sales Part Number: 0910-0015
The Battery Option KOP Contains:

QTY	PART NUMBER	DESCRIPTION
1	(*)126966 00A	Battery Pack Assb.
1	(*)126976 00A	Battery Chassis Assb.
1	(*)126977 00A	Installation Instr.
1	(*)125668 00A	Charger I/O PCB

Package of Misc. Parts			
4	(*)126956 00A	Standoff, 5/16-18 x	
4	(*)126968 00A	2.75*	
1	(*)126969 00A	Foot Assb. 5/16-18	
1	(*)126970 00A	Power Harness	
4	RO2502 00A	Switch Harness	
1	R02544 00A	Screw, 8-32 x 1/4″ #8 Ext. Tooth	
1	R03298 00A	Lockwasher	
1	R03612 00A	Nut, 8-32 w/Lockwasher	
		Screw, 8-32 x 3/8″ w/Lockwasher	

(*) - May have letter prefix.

NOTE: Serial I/O Interface (20 mA or RS-232) are not available with the battery KOP

2. RS-232C Output KOP
Service Part Number: (*) 127002 00A
Sales Part Number: 0901-0213

The RS-232C Output KOP Contains:

QTY.	PART NUMBER	DESCRIPTION
1	(*)122696 00A	PCB Assb., RS-232
1	(*)128574 00A	Printer Harness
1	(*)127003 00A	Installation Instructions

(*) - May have letter prefix.

3. EPROM Upgrade KOP
Service Part Number: (*) 131929 00A
Sales Part Number: 0901-0250

The EPROM Upgrade KOP contains:

QTY	PART NUMBER	DESCRIPTION
1	(*) 122681 00A	I.C. EPROM
1	(*)131928 00A	Instruction Sheet
1	(*)126432 00A	Label

(*) - May have letter prefix.

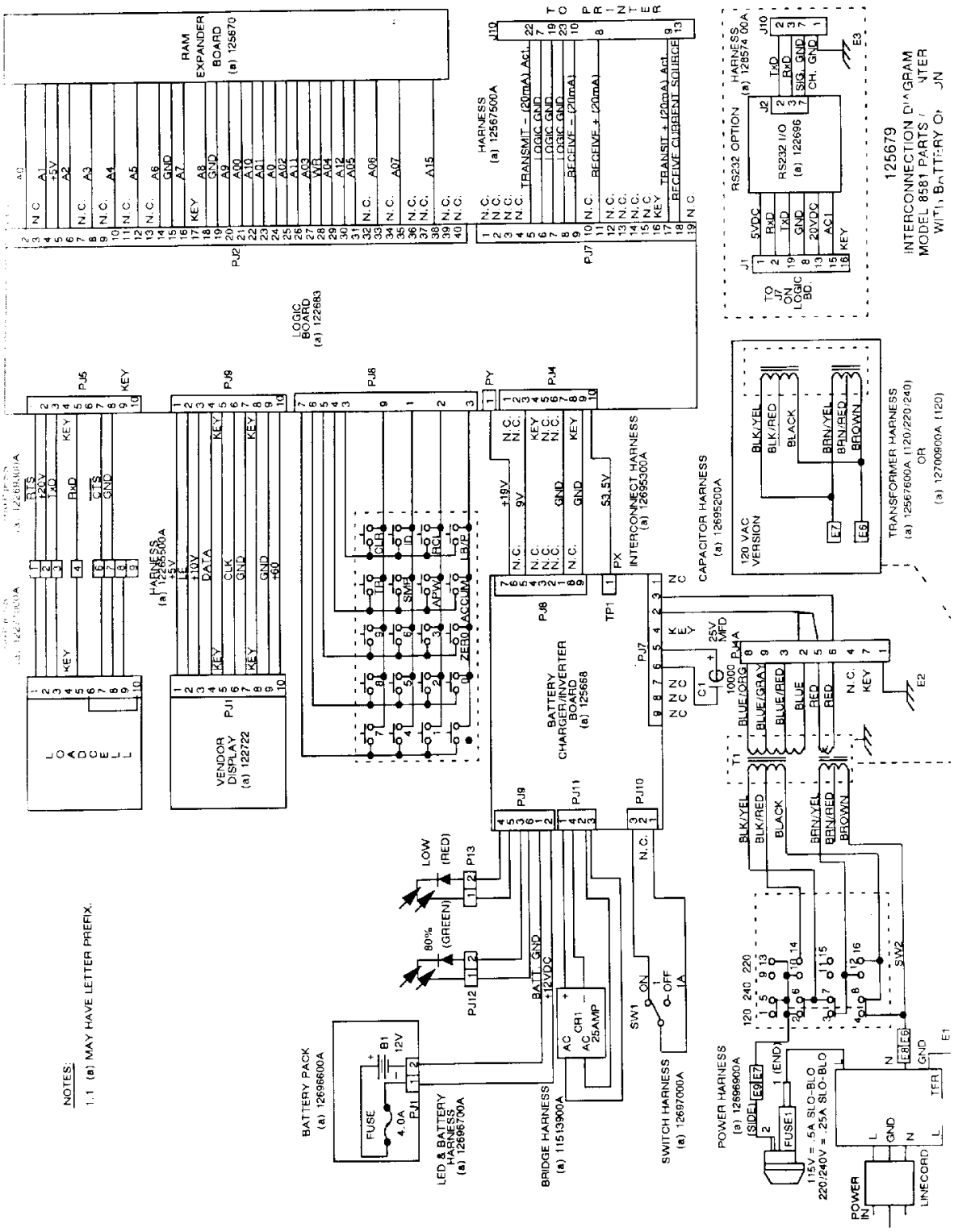
9.7 ACCESSORIES

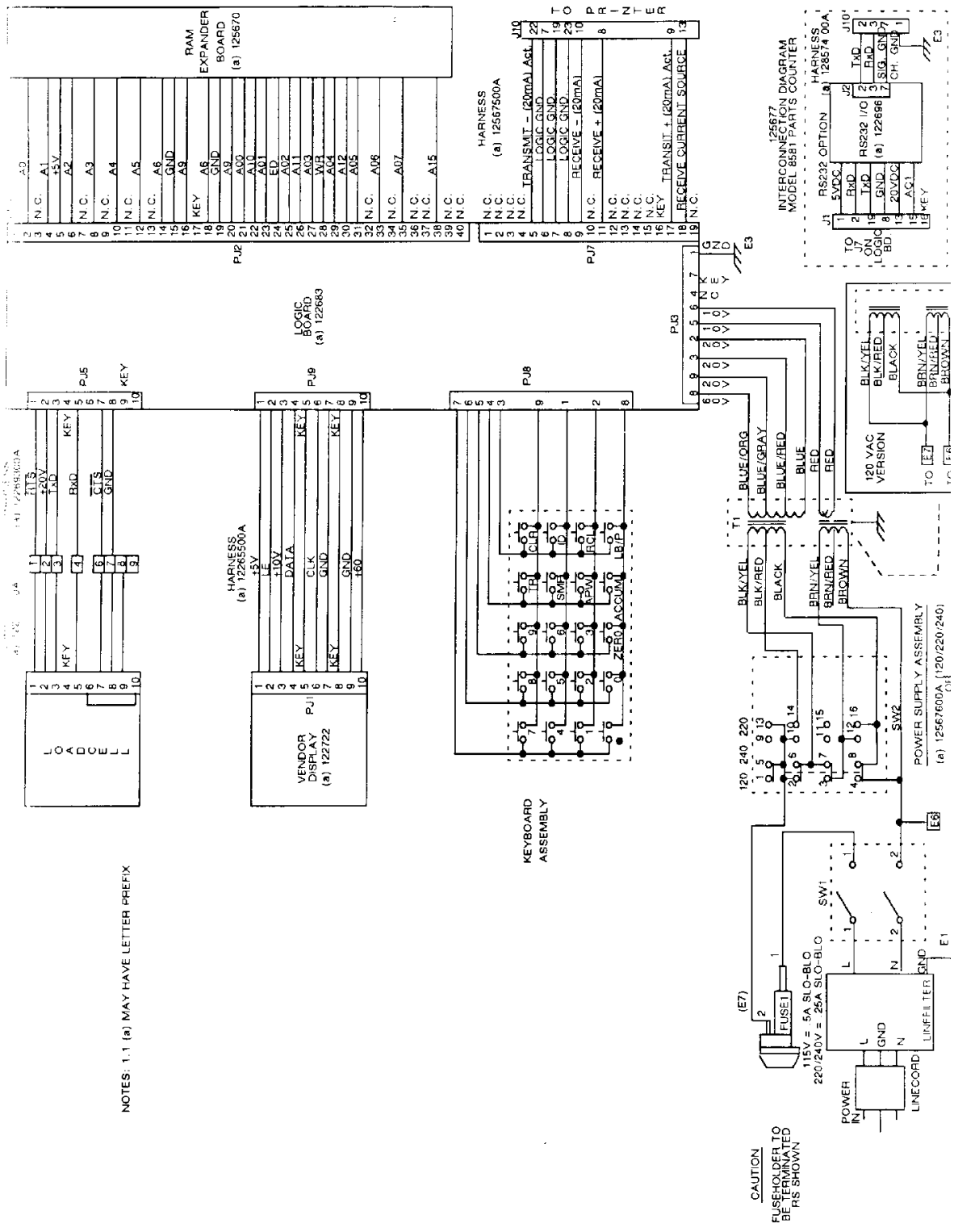
1. Stainless Steel Platter
Service Part Number: A123611 00A
Sales Part Number: 0906-0122

2. 1-1/2 quart shoe Scoop KOP
Service Part Number: 115208 00A
Sales Part Number: 0906-0081

(*) May have a letter prefix.

10. INTERCONNECT DRAWINGS




RAM EXPANDER BOARD (a) 125670
PJ2
HARNESS (a) 12567500A
PJ7
TO PRINTER
E3
INTERCONNECTION DIAGRAM MODEL 8581 PARTS COUNTER 125677
HARNESS (a) 128574 00A
RS232 OPTION
RS232 I/O (a) 122696
TO J7 ON LOGIC BD
LOGIC BOARD (a) 122683
PJ5
PJ9
PJ8
PJ3
KEY
LOADCELL
HARNESS (a) 12265500A
VENDOR DISPLAY (a) 122722
PJ1
KEYBOARD ASSEMBLY
T1
120 VAC VERSION
TO E2
POWER SUPPLY ASSEMBLY (a) 12567600A (120/220/240)
SW2
SW1
FUSE1
115V = 5A SLO-BLO
220/240V = 25A SLO-BLO
LINEFILTER
POWER IN
LINECORD
CAUTION
FUSEHOLDER TO BE TERMINATED AS SHOWN
NOTES: 1.1 (a) MAY HAVE LETTER PREFIX

11. SOFTSWITCH SETTINGS

Chart 14

			INITIAL SETUP
F1	CONFIGURE OPERATIONAL FUNCTIONS		
	F1.1	ENABLE OPERATOR OVERRIDE	OFF
	F1.2	I.D. ENABLE	OFF
	F1.3	I.D. MANDATORY	OFF
	F1.4	I.D. AUTO CLEAR	OFF
	F1.5	TARE AUTO CLEAR	ON
	F1.6	APW AUTO CLEAR	ON
	F1.7	APW ENHANCEMENT	ON
	F1.8	DISPLAY PERCENT OF ACCURACY	OFF
F2	CONFIGURE UNIT FUNCTION		
	F2.1	APW/PIECES PER LB	OFF
	F2.2	MINIMUM SAMPLE SELECT	0.02
	F2.3	AUTO SAMPLE SELECT	ON
	F2.4	TARE ENABLE	ON
	F.2.5	KEYBOARD TARE	OFF
	F2.6	LB/KG SWITCHING	OFF
	F2.7	CALIBRATION UNITS (F REV. OR NEWER) 0	
	F2.7	CALIBRATE IN POUNDS (E REV. OR OLDER)	ON
	F.28	POWER UP IN POUNDS	ON
	F2.9	BEEPER ENABLE	OFF
	F2.10	LINEARITY COMPENSATION (F REV. OR NEWER) OFF	
	F2.11	ENHANCED APW REPEATABILITY (R REV. OR NEWER)	OFF
	F2.12	AZM IN COUNT MODE	ON
	F2.13	APW DECIMAL POINT POSITION	5
F3	CONFIGURE CALIBRATION		
	F3.1	EXPANDED WEIGHT DISPLAY	OFF
	F3.2	CONFIGURE SCALE (PRESS 1 TO CONFIGURE AND CALIBRATE SCALE)	
	F3.3	CAPACITY SELECTION	XXX
	F3.3	INCREMENT SIZE (F REV. OR NEWER)	XXXXX
	F3.4	AUTO ZERO MAINTENANCE ENABLE	ON
	F3.5	DIGITAL FILTERING SELECTION (F REV. OR NEWER)	0
	F3.6	TARE INTERLOCK ENABLE	OFF
F4	CONFIGURE COMMUNICATION PORT		
	F4.1	DATA I/O ACTIVE (F REV. OR NEWER)	0
	F.4.1	PRINTER ACTIVE (E REV. OR OLDER)	ON
	F4.2	CHECKSUM ACTIVE	OFF
	F4.3	BAUD RATE SELECT	XXXX

F4.4	SINGLE LINE PRINTING OFF	
F4.5	PRINT I.D.	ON
F4.6	PRINT CONSECUTIVE NUMBER	OFF
F4.7	PRINT GROSS WEIGHT	ON
F4.8	PRINT TARE WEIGHT	OFF
F4.9	PRINT NET WEIGHT	ON
F4.10	PRINT NET EXPANDED	OFF
F4.11	PRINT APW	ON
F4.12	PRINT PIECE COUNT	ON
F4.13	PRINT PIECE COUNT EXPANDED	OFF
F4.14	REPEAT PRINT	OFF
F4.15	PRINT COMMA (F REV. OR NEWER)	OFF