METTLER TOLEDO

8270

Scale

Service Manual

For Models
8270-10X0
8270-20X0
8270-3000
8270-4X22
8270-5XXX
8270-6XXX

METTLER TOLEDO

Publication Revision History

An overview of this manual's revision history is compiled below.

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Part Number	Date	Revisions
A14716000A	12/98	Added Information for new models 8270-1000, 8270-2000, 8270-4122, 8270-5000. Added information for model 8270-6000, updated information to include the use of Eagle Plus loadcell in all 8270 models, updated BOM for tare bar.

INTRODUCTION

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

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

METTLER TOLEDO
1900 Polaris Parkway
Columbus OH 43240-2020
(614) 438-4511

FCC Notice

This device complies with Part 15 of the FCC Rules and the Radio Interference Requirements of the Canadian Department of Communications. Operation is subject to the following conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

METTLER TOLEDO RESERVES THE RIGHT TO MAKE REFINEMENTS OR CHANGES WITHOUT NOTICE.

PRECAUTIONS

READ this manual BEFORE operating or servicing this equipment.

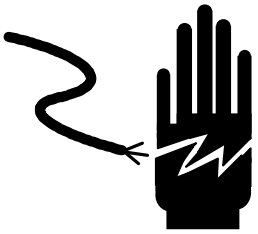
FOLLOW these instructions carefully.

SAVE this manual for future reference.

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

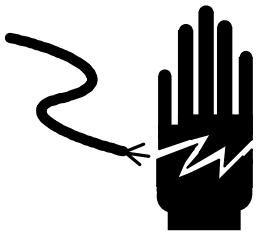
ALWAYS DISCONNECT this equipment from the power source before cleaning or performing maintenance.

CALL METTLER TOLEDO for parts, information, and service.



⚠ WARNING

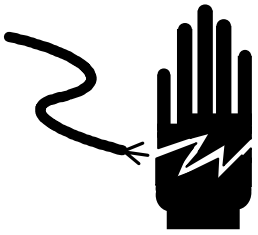
ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY HARM.



⚠ WARNING

FOR CONTINUED PROTECTION AGAINST SHOCK HAZARD CONNECT TO PROPERLY GROUNDED OUTLET ONLY.

DO NOT REMOVE THE GROUND PRONG.

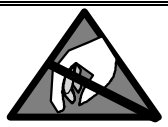


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE REMOVING THE FUSE OR SERVICING.

⚠ CAUTION

BEFORE CONNECTING/DISCONNECTING ANY INTERNAL ELECTRONIC COMPONENTS OR INTERCONNECTING WIRING BETWEEN ELECTRONIC EQUIPMENT, ALWAYS REMOVE POWER AND WAIT AT LEAST THIRTY (30) SECONDS BEFORE ANY CONNECTIONS OR DISCONNECTIONS ARE MADE. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN DAMAGE TO, OR DESTRUCTION OF THE EQUIPMENT OR BODILY HARM.



CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

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General Description

This product was developed, produced and tested in a Mettler Toledo facility that has been audited and registered according to international (ISO 9001) quality standards.

The Model 8270-1XXX, 8270-2XXX, 8270-5XXX and 8270-6XXX are low profile scale bases with RS232 communications. The Model 8270-1X1X and 8270-2X1X are prepack 50 x .01 lb or 20 x .005 kg scales which are supplied with rubber feet and a platter. The 8270-1XXX and 8270-2XXX are used with Mettler Toledo indicators for back room weighing applications. The Model 8270-5XXX, a 50 lb x 0.1 oz. not legal for trade scale and the 8270-6XXX a 50 x .01lb legal for trade scales can use Model 264 displays.

The Model 8270-1000,2000, and 3000 are low profile, 5000 d (H-44), 50 x 0.01 lb / 4000 d (OIML R-76) 20 kg x .005 capacity, prepack scale bases with an RS-232C serial interface. These models are supplied without feet or a platter. The scale comprises of a die cast base and spider, a 100kg Eagle + load cell and an UltraRes PCB that provides A/D weight processing and communications. Power is provided through the interface cable from the controller. Scale calibration is performed from the controller using the RS232 Interface. The 8270 Scale is designed for use in stepsaver and autolabeling operations.

The Model 8270-4122 and 5122 are scales designed for food preparation applications in a not legal-for-trade environment. The Tare Bar, as well as the Tare Button on the display support chain tare. The Model 8270-4122 and 5122 comprises of a die cast base and spider, a 45 kg Eagle + load cell, and a UltraRes PCB providing A/D conversion and weight processing. In addition, a stainless steel display and tare switch assembly accommodate a display and a front mounted tare bar.

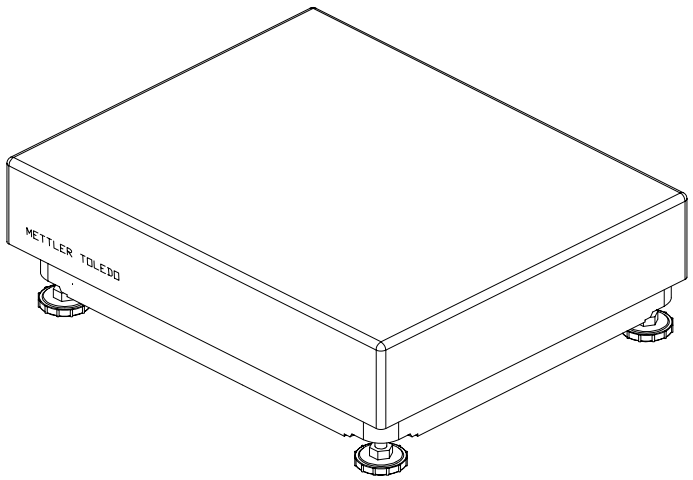


Figure 1-1 Model 8270 1XXX and 2XXX

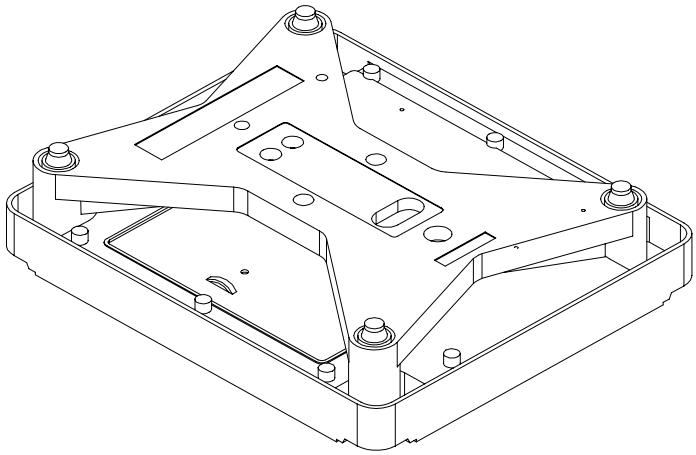


Figure 1-2 Model 8270-3000 Scale Base

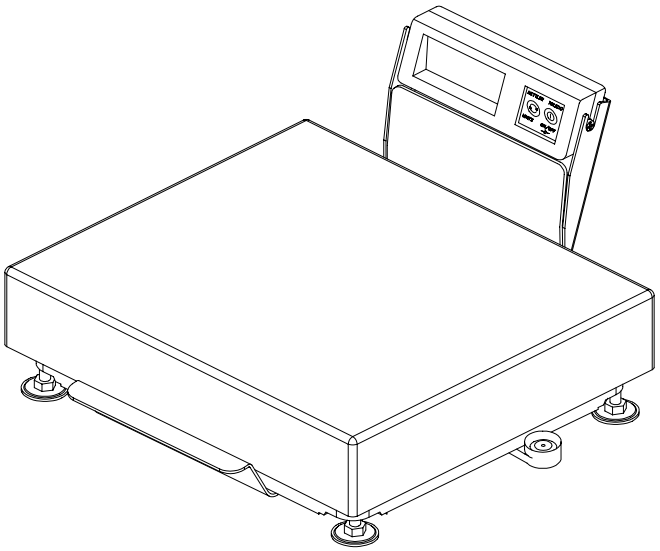


Figure 1-3 Model 8270-4X22 and 5X22

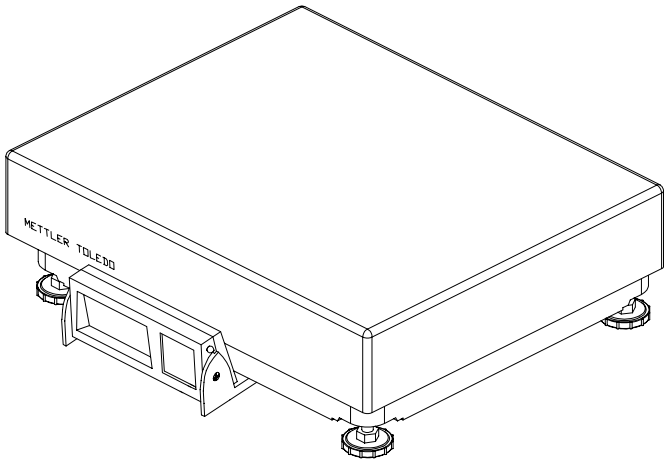


Figure 1-4 Model 8270-5XXX and 6XXX

2 Specifications

Index of Specifications

8270-1XXX-XXX	50 lb/20 kg NTEP	(Weigh Platform Retail)
8270-2XXX-XXX	50 lb/20 kg CW&M	(Weigh Platform Retail)
8270-3XXX-XXX	50 lb/20 kg	(Weigh Platform Wrapper)
8270-4XXX-XXX	20 x 0.005 lb/10 x .002 kg	Not legal for trade
8270-5XXX-XXX	50 lb x 0.2 oz./ 20 x .005kg	Retail Scale (not legal for trade)
8270-6XXX-XXX	50 x .01lb/20 x .005 kg NTEP/CW&M	Retail Scale

Dimensions

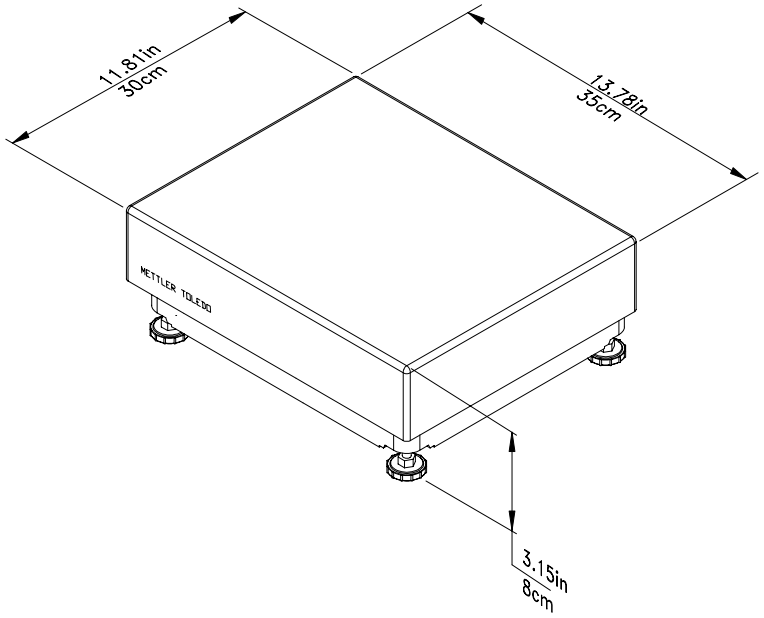


Figure 2-1: Model 8270 1XXX and 2XXX Dimensions

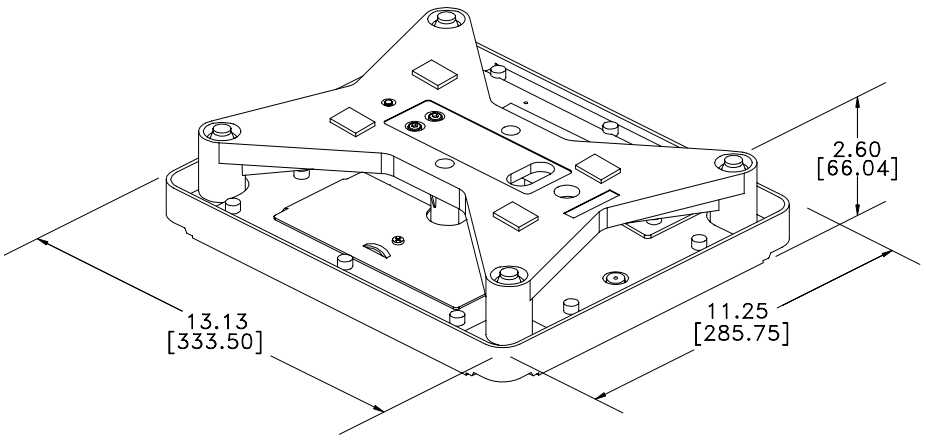


Figure 2-2: Model 8270-3000 Dimensions

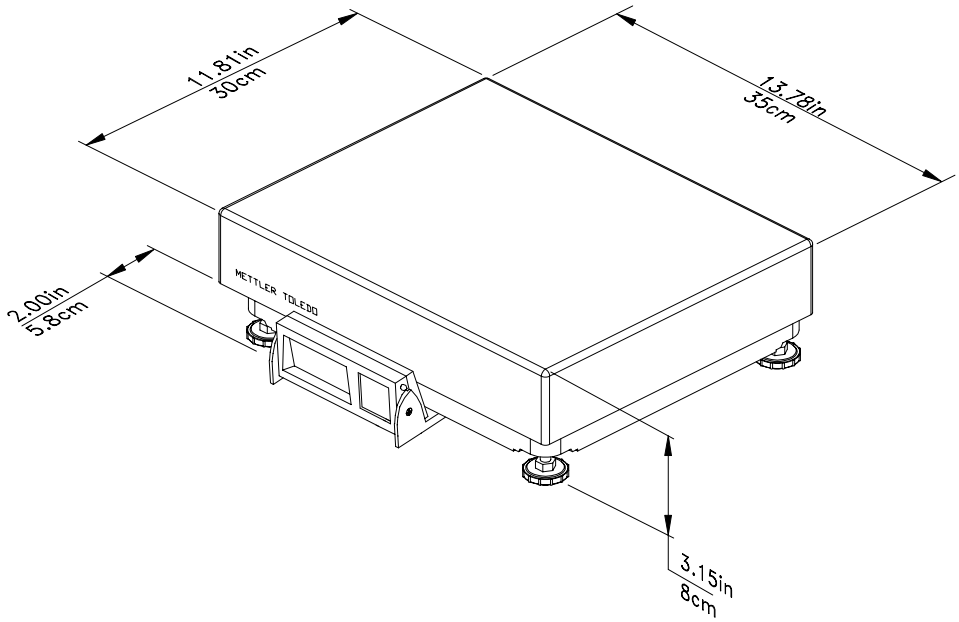


Figure 2-3: Model 8270-5XXX and 6XXX Dimensions

Physical Construction

The base is die-cast aluminum. The spider is die-cast and uses setscrew overload stops. The Level Bubble is mounted to the base. Some models include a stainless steel platter.

Power Requirements

An external 7.5 VDC to 15 VDC 60 mA power source supplies power to the Model 8270 via Pin 6 and 9 at J3 on the Host Port DB9 connector (with Jumper W1 shorted), or through the external power Jack J3.

Electrical Interfaces

The Model 8270 has a single main board with a load cell connector for the Eagle Load Cell, a DB9 Female Connector for RS-232 and power input, an external power jack, and Remote Display Jack. The Model 8270-4X22 and 8270-5122 scales use the RS232 connector to interface to the front mounted tare switch.

Host Communication

Communication to a host PC or controller is via a 9-pin female D sub-miniature connector employing RS-232C signal levels. The pinout of the female DB-9 connection is as follows:

Pin #	Function
1	Chassis / Signal Ground
2	TxD
3	RxD
4 & 5	Internally connected together (These pins can be jumpered to ground by shorting W2.)
6	Power input 7.5VDC to 15VDC. (Enabled by shorting Jumper W1).
7	Ground
8	DTR
9	GND

Table 2-1: Host Port Wiring

Environmental Requirements

The Model 8270 operating range is 0° to +40° C (+32° to +104° F) at 10 to 90% relative humidity, non-condensing. The shipping and storage temperature range is -20° to +60° C (-4° to +140° F) at 0 to 95% relative humidity, non-condensing. This unit is not intended for washdown or hazardous area operation, nor for operation in environments of extreme dust, heat, cold, or humidity.

Standards Compliance

The 8270-2XXX, 3XXX, 6XXX meets the following agency approvals:

- NIST H-44 and Canadian 5000d requirements for a 50 x .01 lb scale over the temperature range of 0°C to +40°C.
- New Jersey and California Type Approvals
- Canadian Weights and Measures approval for a 20 x .005 kg scale over the temperature range of 0 degrees C to 40 degrees C.
- The 8270-1XXX meets NIST H-44, New Jersey and California Type Approvals for a 50 x .01 lb scale.

Capacity

The Model 8270 can be calibrated in 20 x 0.005 kg, 50 lb X 0.2 oz, 50 x 0.01 lb, 15 x 0.005 kg, 30 x 0.01 lb, *20 x .005 lb, or *10 x .002 kg capacities.

*RS232 is not available when the Model 8270 is set for these not legal-for-trade builds.

Overloading

The Model 8270 is designed for Static Overloads of up to 300% rated scale capacity placed on the platter and Dynamic overloads of 100% of rated scale capacity dropped from a height of 152 mm (6 in) directly onto the platter.

Reliability

The Model 8270 is designed for continuous operation with a MTBF of 40,000 hours.

3

Installation and Calibration

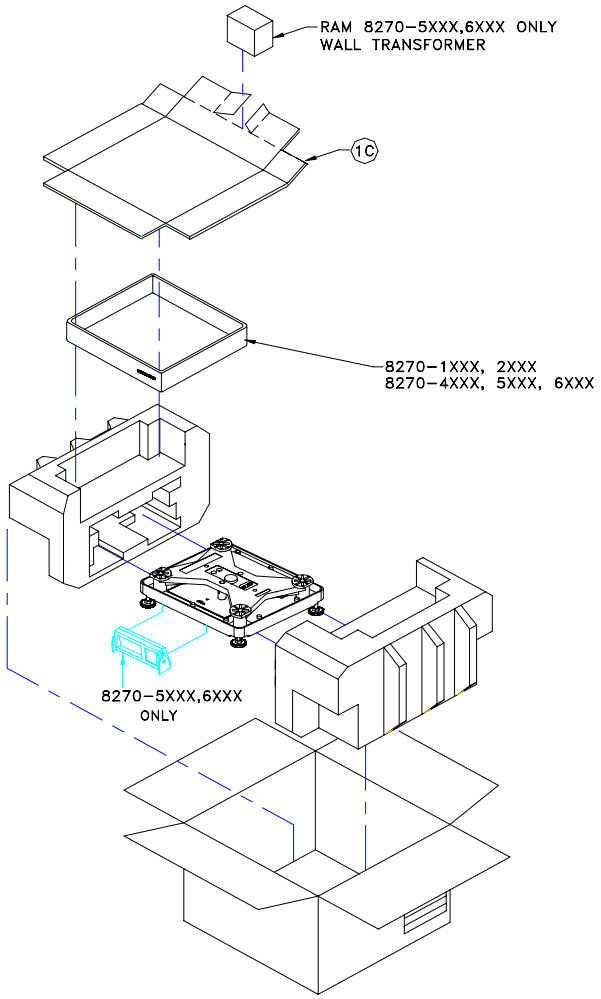
This chapter gives detailed instructions and important information you will need to install the Model 8270 successfully. Please read this chapter thoroughly before you begin installation.

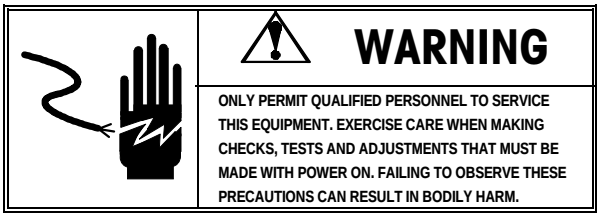
Unpacking

Note: If you choose to dispose of the package, please recycle the materials. The packaging is recyclable natural fiber with biodegradable adhesives.

Please inspect the package as it is delivered by the carrier. If the shipping container is damaged, check for internal damage and file a freight claim with the carrier if necessary. If the container is undamaged, open the box, remove the scale and place it on a solid, flat surface. Please keep the packing material and shipping insert in case the scale needs to be returned to Mettler Toledo. The Model 8270 is a precision instrument and may be permanently damaged if not shipped in factory-approved packaging.

Figure 3-1: Unpacking





WARNING

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WARNING

For continued protection against shock hazard, connect to properly grounded outlet only. DO NOT REMOVE THE GROUND PRONG.

8450 Stepsaver Installation

When connecting the Model 8270 to the Model 8450 (with optional remote scale interface kit) short Jumper W1, W2 and W4 on the Model 8270 Main PCB. Jumper W3 must be Open. (Refer to Figure 3-2.) Connect the 0900-0305 183 cm (6 ft) Cable from the host controller scale port to the Model 8270 DB9 Host connector on the end of the Main PCB (Figure 3-2). Level the scale, using the Level Bubble as a reference, by adjusting the feet until the small bubble is centered in the circle. Follow the instructions shipped with the Stepsaver for installation in the Stepsaver.

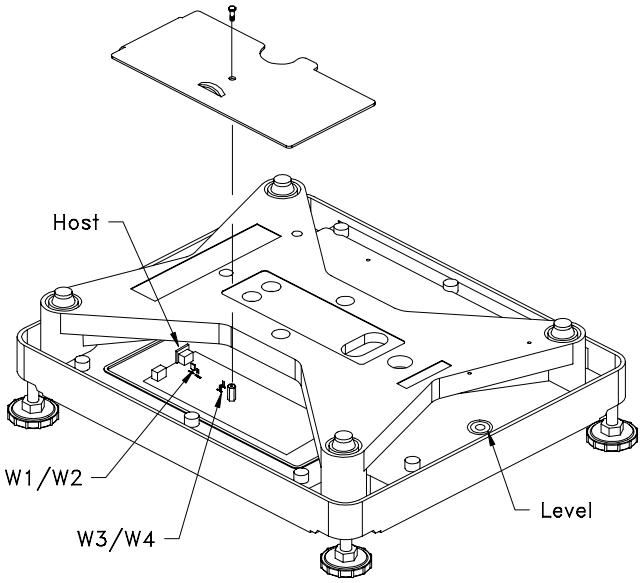


Figure 3-2: W1-W4, Host Connector, and Level

Installation with 8305/8360 Stepsaver or Autolabeler

When using the Model 8270 with an autolabeler or stepsaver, the platter and mounting hardware will be shipped with the appropriate labeler or stepsaver. Refer to the installation guides shipped with the autolabeler or stepsaver for mounting instructions. When used with the model 8360 Prepack Controller, Jumper W1 and W2 must be shorted, and Jumper W3 and W4 must be open. (Refer to Figure 3-2.) When used with the Model 8305, W1, W2 and W4 must be shorted, and W3 open. Connect the cable from the scale port on the 8360 or 8305 to the DB9 Host connector (as shown in Figure 3-2).

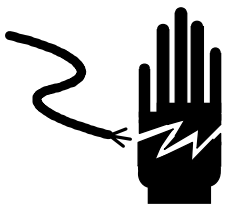
Jumper Summary

The following is a summary of Model 8270 Jumper settings when used with various retail scales and a personal computer.

	W1	W2	W3	W4
8450/355	shorted	shorted	open	shorted
8305	shorted	shorted	open	shorted
8361	shorted	shorted	open	open
8460	shorted	shorted	open	shorted
8461	shorted	shorted	open	shorted
8360	shorted	shorted	open	open
PC	open	shorted	open	shorted

Calibration

Following are calibration instructions for the different versions of the Model 8270.



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Model 8270 1XXX, 2XXX, and 3XXX

The Model 8270 10X0, 20X0, and 3000 are calibrated by the host or controller it is connected to. Follow the calibration instructions for the controller to calibrate the Model 8270.

Model 8270 4XXX, 5XXX and 6XXX

The Model 8270-4XXX, 8270-5XXX and 8270-6XXX are calibrated with the display unit using the keyboard. Jumpers W3 and W4 must be removed for calibration.

When both Jumper W2 and W3 (TEST) are installed, the scale will enter FACTORY TEST MODE upon power-up or reset. This also defaults all categories (even the special ones) to a known default state as follows:

Parameter	Default	Option 1	Option 2	Option 3	Option 4
Auto Zero Capture "ACr"	2%	2%			
Build "buiLd" 8270-1XXX, 2XXX, 3XXX, 6XXX	50 x .01 lbs	20 x .005 kg	50 x .01 lbs	15x .005 lb	30 x .01 lb
Build "buiLd" 8270-4XXX, 5XXX	50 x .01 lbs	50 lb x 0.2 oz.	none	20 x .005 lb	10 x .002 kg
Mode "Mode"	Normal	Test	Expand	Normal	
Filter "FILtEr"	Light	Light	Medium	Heavy	
Baud "bAud"	9600	9600			
ASCII Bits "ASCII"	7	7			
Parity "PAr"	Even	Even			
Stop Bits "StOP"	1	1			
Protocol "PrOtO"	Toledo	Toledo			
Sleep "SLEEP" 8270-4XXX, 5XXX only	diSAbL	diSAbL	5 nin		
Calibrate "CAL"		No	Yes		
Leave or End "LEAVE"		Default	Abort	Save	No

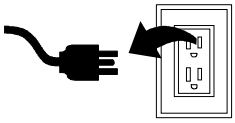
Parameter	Option 4	Option 5	Option 6	Option 7	Option 8
Auto Zero Capture "ACr"					
Build "buiLd" 8270-1XXX, 2XXX, 3XXX, 6XXX	30 x .01 lb	10 x .002 kg	20 x .005 lb		
Build "buiLd" 8270-4XXX, 5XXX	10 x .002 kg	30 x .01 lb	15 x .005 kg	50 x .01 lb	20 x .005 kg
Mode "Mode"					
Filter "FILtEr"					
Baud "bAud"					
ASCII Bits "ASCII"					
Parity "PAr"					
Stop Bits "StOP"					
Protocol "PrOtO"					
Sleep "SLEEP" 8270-4XXX, 5XXX only					
Calibrate "CAL"					
Leave or End "LEAVE"					

Table 3-1: Setup Mode Functions

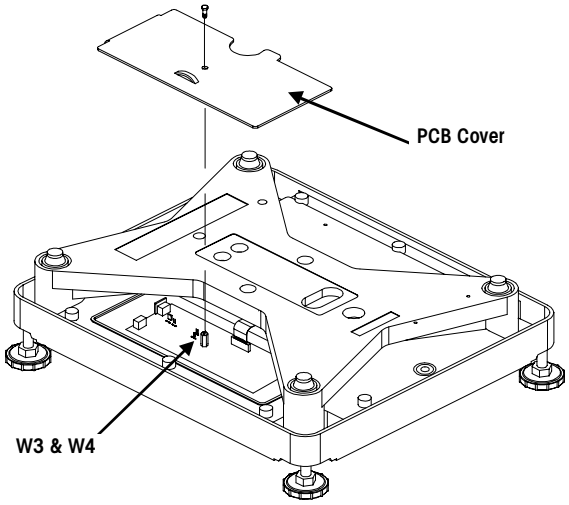
To change any options, remove the shorting block from Jumper W3 (W4 must also be open). Press and hold the TARE key until **SETuP** displays. Press TARE to select the category. Press ZERO to select the options under each category. When the desired option is displayed, press TARE to select it. After changing any options, press TARE until **LEAVE** displays. Press ZERO to select **Default**, **Abort**, **Save**, or **No**.

Calibration

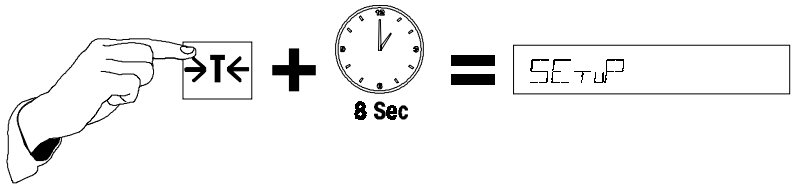
- Disconnect power to the scale.



- Remove the PCB Cover. Remove the shorting block from Jumper W3 (W4 must also be open). Install the platter.



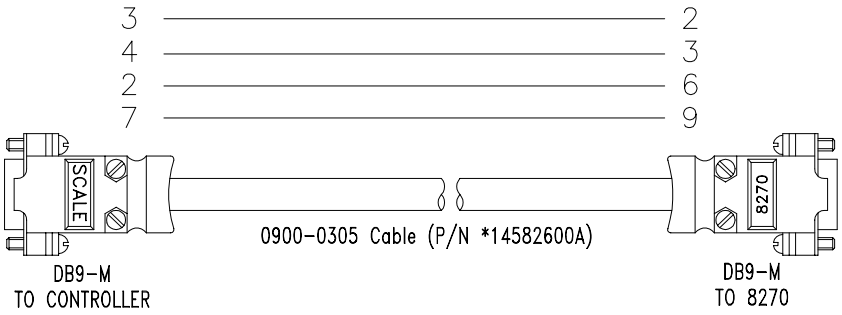
- Connect power to the scale. Press the TARE key and hold until the message "**SEuP**" is displayed. Release the TARE key.



- Press TARE several times until "**CAL"** is displayed. Press the ZERO key to select YES, then press TARE to begin calibration.
- When "**Empty"** displays, make sure the platter is empty then press TARE to set Zero.
- When **"Add Ld"** displays, add 20 lb for lb builds, or 10 kg for kg builds, then press TARE to set span.
- When **"donE"** displays, the scale will restart.
- Disconnect power to the scale. Install the shorting block on jumper W3. Re-install the PCB cover plate.

Cable to Controller

Figure 3-2 illustrates the cable from the Model 8270-3000 to the model 8305, 8360, 8361, and 8450 controllers.



* = May have letter prefix.

Figure 3-2: Scale Cable to Controller

Metrological Seal Installation

If a wire seal or destructible label seal is required for W & M requirements, the 8270 can be sealed after calibration and setup by installing a wire seal or destructible label seal on the Main PCB access cover, as shown in Figure 3-3.

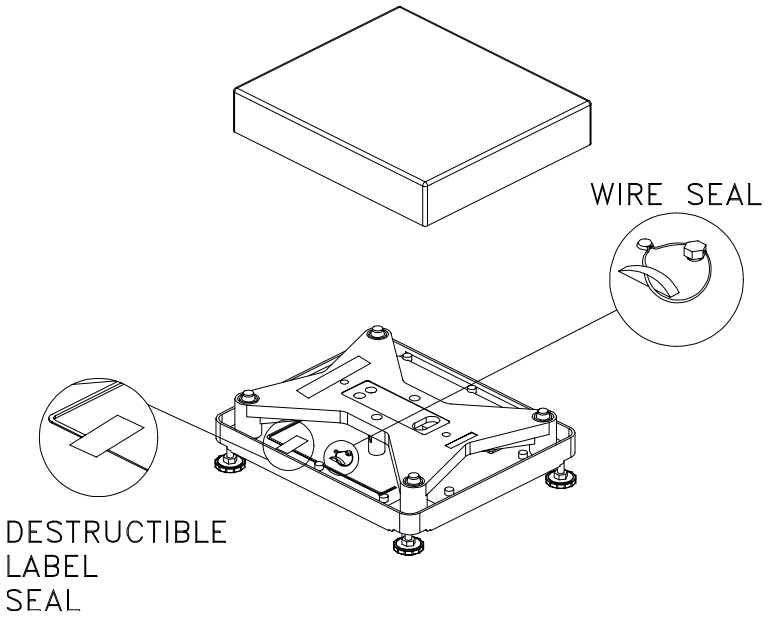
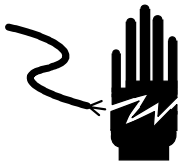


Figure 3-3: Metrological Seal Installation

4 Service and Maintenance

Cleaning

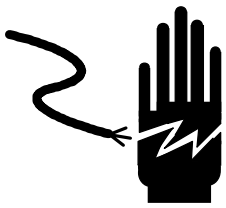
The Model 8270 requires no normal maintenance other than cleaning with a clean damp cloth. Always turn the power off to the controller before performing any maintenance on the scale. The Model 8270 is not designed for a hose-down environment. Do not spray liquids directly on the unit. Do not use solvents or commercial cleaners on the unit.



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE CLEANING.

Troubleshooting



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If the controller is experiencing difficulties in communicating with the scale base, a PC using standard communication software can be used to determine if the problem is in the base or the controller.

NOTE: When connecting a PC RS232 Serial Port to the Model 8270 an external +12VDC supply must be connected to the Optional Input Power Jack at J3 on the Logic PCB. The standard Mettler Toledo 120VAC/+12VDC Wall Transformer, P/N 14078900A, can be used to supply a +12VDC input to the scale. Any suitable DC supply can be used as long as the output voltage to the scale is between 7.5 VDC and 15 VDC @ 60 mA. The input jack J3 is center positive.

DISPLAY ERROR MESSAGES

E1 = EEPROM CHECK SUM ERROR (FATAL ERROR, SERVICE REQUIRED)

E2 = RAM ERROR (FATAL ERROR, SERVICE REQUIRED)

E3 = EEPROM ERROR (RE-CALIBRATE MAY CORRECT ERROR)

E4 = TC ERROR (FATAL ERROR, SERVICE REQUIRED)

Host Interface

To check the scale output using a PC, connect the PC's RS232 Serial Port to the Model 8270 Host Connector as shown in Table 4-1 or 4-2.

From PC - **DB25-F** RS232 SERIAL PORT	**To 8270 - DB9-M**
2 TRANSMIT	3 RECEIVE
3 RECEIVE	2 TRANSMIT
7 SIG GROUND	1 SIG GROUND

Table 4-1 Standard PC RS232 DB-25 To 8270

From PC - **DB9-F** RS232 SERIAL PORT	**To 8270 - DB9-M**
2 RECEIVE	2 TRANSMIT
3 TRANSMIT	3 RECEIVE
5 SIG GROUND	1 SIG GROUND

Table 4-2 Standard PC RS232 DB9 To 8270

Using Comtool or other suitable communications software, set the parameters as follows:

Baud Rate (9600)
Parity (Even)
ASCII Bit String (7)
Stop Bits (1)

The Model 8270 acts as a peripheral device when connected to a host computer. When the host requests weight data by sending an uppercase W, the scale will respond with the weight data or a status byte if the scale is in motion or an invalid state. The host can also request a scale zero operation, in which case the scale will respond with the scale status, so the host can determine if the scale is in zeroing range and/or if the scale is at zero. A scale confidence test can also be initiated by the host to cause the scale to perform RAM, ROM, and NOVRAM tests and put the results in a status byte for later interrogation by the host.

NOTES:

- An ASCII ? is sent by the scale to indicate the following byte is a non-ASCII status byte.
- STX ($^{S}_{T_X}$) indicates the ASCII Start-Of-Text character (decimal 2).
- CR ($^{C}_{R}$) indicates the ASCII carriage return character (decimal 13).
- LF ($^{L}_{F}$) indicates the ASCII line feed character (decimal 10).

If a confidence test results in an error, the scale will not respond to the W or Z commands until the error condition is corrected. An error will also cause the scale to halt any weighing operation until cleared. Table 4-3 lists the ASCII commands the scale will respond to.

*ASCII COMMAND FROM HOST	SCALE RESPONSE	DESCRIPTION
W	$^{S}_{T_X}$ WW.WW$^{C}_{R}$	Gross Weight Pounds.
	$^{S}_{T_X}$ WW.WWW$^{C}_{R}$	Gross Weight KG.
	$^{S}_{T_X}$ WW.WWN$^{C}_{R}$	Net Weight Pounds. ASCII N added after weight.
	$^{S}_{T_X}$ WW.WWWN$^{C}_{R}$	Net Weight KG. ASCII N added after weight.
	$^{S}_{T_X}$?*status byte*$^{C}_{R}$	Out of range or in motion. Use Table 4-4 to determine status byte results.
H	$^{S}_{T_X}$ WWW.WWW$^{C}_{R}$	High resolution weight data in lb.
	$^{S}_{T_X}$ WW.WWWW$^{C}_{R}$	High resolution weight data in kg.
Z	$^{S}_{T_X}$?*status byte*$^{C}_{R}$	Zero scale unless out of range, or under/over capacity.
TWWWWW$^{C}_{R}$	$^{S}_{T_X}$?*status byte*$^{C}_{R}$	Digital Tare Command.
C	$^{S}_{T_X}$CALIBRATE$^{C}_{R}{}^{L}_{F}$	Initiate host interface scale configuration.
S	$^{S}_{T_X}$ SETUP$^{C}_{R}$	Initiate host interface setup.
A	$^{S}_{T_X}{}^{C}_{R}$	Initiate Confidence Test Command. $^{S}_{T_X}{}^{C}_{R}$ are sent indicating command was received.
B	$^{S}_{T_X}$?*status byte*$^{C}_{R}$	Send Confidence Test Results. **A** must be sent prior to the Send Result command **B**. Results of the test are contained in a status byte. Use Table 4-4 to determine test results. If all tests passed, the ASCII **@** character will be returned.
E	$^{S}_{T_X}$E$^{C}_{R}$	Start Echo Mode Serial Port Test Command. Scale will respond with an E indicating command received. Characters except F will be echoed back to the host.
F	$^{S}_{T_X}$F$^{C}_{R}$	Exit Echo Mode
Q	$^{S}_{T_X}$ *?status byte*$^{C}_{R}$	Send Scale Status
R	$^{S}_{T_X}$ *?status byte*$^{C}_{R}$	Clear Tare

(* MUST BE UPPERCASE CHARACTERS ONLY.)

Table 4-3: ASCII Commands

Status Bytes

When the scale responds with ***STX? statusbyteCR***, this indicates a status byte. The status byte contains scale status information, which can include net/gross mode, zero status, etc. The actual status byte sent will be an ASCII character which must be converted to binary to decode the bits. The scale status bit definitions are shown in Table 4-4. On the following page is an ASCII Chart that shows an ASCII character chart with binary conversion that can be used to convert the status bytes.

BIT #	BIT DESCRIPTION
6	1 = Bad Command from host. 0 = Normal.
5	1 = Scale in Net Mode, 0 = Gross Mode
4	1 = Center of zero. 0 = Not at center of zero.
3	1 = Outside zero capture range. 0 = Within range.
2	1 = Under zero. 0 = Within weighing range.
1	1 = Over capacity. 0 = Within weighing range.
0	1 = Scale in motion. 0 = Stable weight data.

Table 4-4 Scale Status Byte Bit Definitions

Confidence Test

When the scale responds with ***STX? statusbyteCR***, after requesting a confidence test (B), a confidence test status byte will be sent. The status byte contains scale status information shown in Table 4-5. The status byte sent will be an ASCII character which must be converted to binary to decode the bits. The confidence test status bits are shown in Table 4-5. Bit 6 is set to 1 after a confidence test is performed and reset to 0 after the host reads the confidence test status byte. Note: The ASCII @ (decimal 64) indicates all tests were passed. Repeated reads of the confidence byte for all test passed without initiating a new confidence test will result in an ASCII NULL (hex 00).

BIT #	BIT DESCRIPTION
6	1 = New status available. 0 = Host has read data.
5	Always 0.
4	1 = ROM test failed. 0 = ROM test passed.
3	1 = RAM test failed. 0 = RAM test passed.
2	Always 0.
1	Always 0.
0	1 = EEPROM test failed. 0 = EEPROM test passed.

Table 4-5 Scale Confidence Test Byte Bit Definitions

ASCII CHAR.	DECIMAL	HEX	76543210	ASCII CHR.	DECIMAL	HEX	76543210
NULL	0	00	00000000	@	64	40	01000000
SOH	1	01	00000001	A	65	41	01000001
STX	2	02	00000010	B	66	42	01000010
ETX	3	03	00000011	C	67	43	01000011
EOT	4	04	00000100	D	68	44	01000100
ENQ	5	05	00000101	E	69	45	01000101
ACK	6	06	00000110	F	70	46	01000110
BELL	7	07	00000111	G	71	47	01000111
BACKSPACE	8	08	00001000	H	72	48	01001000
TAB	9	09	00001001	I	73	49	01001001
LineFeed	10	0A	00001010	J	74	4A	01001010
Vert. Tab	11	0B	00001011	K	75	4B	01001011
Form Feed	12	0C	00001100	L	76	4C	01001100
Carr.Return	13	0D	00001101	M	77	4D	01001101
Shift Out	14	0E	00001110	N	78	4E	01001110
Shift In	15	0F	00001111	O	79	4F	01001111
Data Link Esc	16	10	00010000	P	80	50	01010000
DC1	17	11	00010001	Q	81	51	01010001
DC2	18	12	00010010	R	82	52	01010010
DC3	19	13	00010011	S	83	53	01010011
DC4	20	14	00010100	T	84	54	01010100
NAK	21	15	00010101	U	85	55	01010101
SYNCH IDLE	22	16	00010110	V	86	56	01010110
End Trans. Block	23	17	00010111	W	87	57	01010111
CANCEL	24	18	00011000	X	88	58	01011000
End Of Medium	25	19	00011001	Y	89	59	01011001
SUBSTITUTE	26	1A	00011010	Z	90	5A	01011010
ESCAPE	27	1B	00011011	[	91	5B	01011011
FS (Cursor Right)	28	1C	00011100	\	92	5C	01011100
GS (Cursor Leff)	29	1D	00011101	]	93	5D	01011101
RS (Cursor Up)	30	1E	00011110	^	94	5E	01011110
US (Cursor Down)	31	1F	00011111	_	95	5F	01011111
SPACE	32	20	00100000	`	96	60	01100000
!	33	21	00100001	a	97	61	01100001
"	34	22	00100010	b	98	62	01100010
#	35	23	00100011	c	99	63	01100011
$	36	24	00100100	d	100	64	01100100
%	37	25	00100101	e	101	65	01100101
&	38	26	00100110	f	102	66	01100110
'	39	27	00100111	g	103	67	01100111
(	40	28	00101000	h	104	68	01101000
)	41	29	00101001	i	105	69	01101001
*	42	2A	00101010	j	106	6A	01101010
+	43	2B	00101011	k	107	6B	01101011
,	44	2C	00101100	l	108	6C	01101100
-	45	2D	00101101	m	109	6D	01101101
.	46	2E	00101110	n	110	6E	01101110
/	47	2F	00101111	o	111	6F	01101111
0	48	30	00110000	p	112	70	01110000
1	49	31	00110001	q	113	71	01110001
2	50	32	00110010	r	114	72	01110010
3	51	33	00110011	s	115	73	01110011
4	52	34	00110100	t	116	74	01110100
5	53	35	00110101	u	117	75	01110101
6	54	36	00110110	v	118	76	01110110
7	55	37	00110111	w	119	77	01110111
8	56	38	00111000	x	120	78	01111000
9	57	39	00111001	y	121	79	01111001
:	58	3A	00111010	z	122	7A	01111010
;	59	3B	00111011	{	123	7B	01111011
<	60	3C	00111100	|	124	7C	01111100
=	61	3D	00111101	}	125	7D	01111101
>	62	3E	00111110	~	126	7E	01111110
?	63	3F	00111111		127	7F	01111111

Calibration Using Host Interface

Model 8270 calibration can be performed using a PC for a troubleshooting test. However, final calibration must be performed on the scale controller or 0264 display. To test the calibration on the PC using Comtool or other suitable communications software, setup the parameters as follows:

Baud Rate (9600)
Parity (Even)
ASCII Bit String (7)
Stop Bits (1)

The scale is calibrated using a 20 lb. or 10 kg test weight appropriate to the avoir/metric build capacity selected.

Host sends:	**C**	
Scale replies:	**STX CALIBRATE? CR LF**	
Host sends:	**Y**	
Scale replies:	**STX EMPTY CR LF**	(empty platter on the scale)
Host sends:	**Y**	(stable zero reading is taken)
Scale replies:	**STX LOAD CR LF**	**(**add 20 lbs)
Host sends:	**Y**	
Scale replies:	**STX DONE CR LF**	

NOTE: Jumper W3 must be in the unlocked position (not shorted) for the scale to acknowledge the C command and initiate the host interface calibrate procedure.

NOTE: Jumper W1 (external power) must also be installed (shorted) and Jumper W4 (reserved) must be open (not shorted).

If calibration can be successfully performed using the PC, but not by the controller, the problem may be in the controller's CPU PCB or cable.

Power Supply Tests

The controller supplies power to the Model 8270-1XXX, 2XXX, and 3XXX scale base Logic PCB through the data cable on Pin 6 and 9 at J1. To check the power input from the controller, refer to Figure 4-1. The input power from the controller can be checked at Jumper W1 to Chassis Ground which is the stud in the center of the PCB. The voltage from the controller should be between +12 VDC and +14 VDC. If the voltage is zero or outside this range, check the cable from the controller and the power at the controller.

Power to the load cell counterforce can be checked at Pin 1 to Chassis Ground at connector J4. The voltage at Pin 1 to ground should measure between +4.5 VDC and +5.5 VDC. If the voltage is zero or outside the range, replace the Logic PCB.

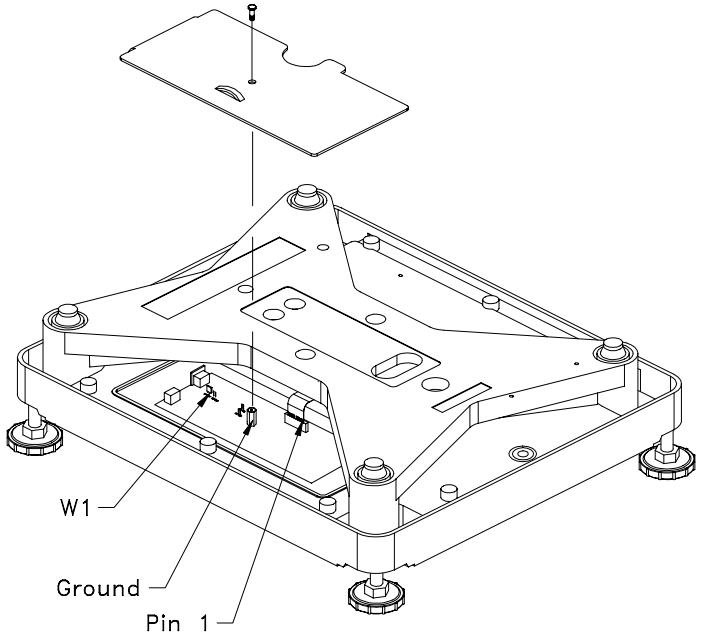


Figure 4-1: Power Test Points

Load Cell & Spider Replacement

If the Spider or Load Cell is replaced, the screws must be torqued properly and the overload stops must be checked and set. Refer to Figure 4-2 for locations of the components.

Spider Replacement/Removal - Use a 6 mm Hex Wrench to remove the socket head hex screws at location A in Figure 4-2 to remove the spider. If the spider is replaced, you must check and adjust the overload stops at location C-F using a gap gauge and a 4 mm Hex Wrench for adjustment. Refer to Table 4-6, 4-7, and 4-8.

Load Cell Replacement - Use a 6 mm Hex Wrench to remove the socket head hex screws at location A to first remove the spider, then at location B to remove the Load Cell. Torque the hex screws to 17 Nm (Newton-meters) or 150 in-lb. The overload stops at location C-F must be checked using a gap gauge and a 4mm Hex Wrench for adjustment. Refer to Table 4-6, 4-7 and 4-8.

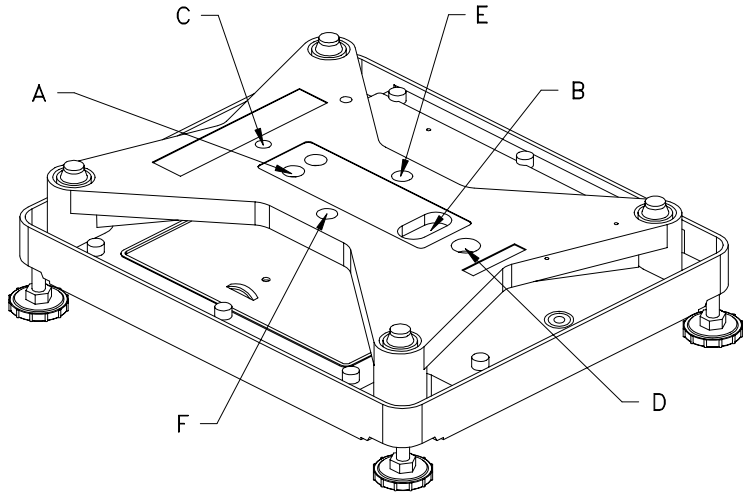


Figure 4-2: Overload Stops and Spider/Load Cell Screw Locations

Factory No.	Position (Figure 4-2)	Gap (Tolerance) w/14694300A Loadcell	Gap (Tolerance) w/15238900A Loadcell
1XXX, 2XXX, 3XXX 6XXX	C	0.018 In (±0.002 in)	0.018 In (±0.002 in)
	E, F	0.010 In (±0.002 in)	0.010 In (±0.002 in)
	D	0.025 In (±0.002 in)	0.025 In (±0.002 in)

Table 4-6: Overload Stop Gap Specifications for 1XXX, 2XXX, 3XXX, 6XXX

Factory No.	Position (Figure 4-2)	Gap (Tolerance) w/15097700A Loadcell	Gap (Tolerance) w/15472900A Loadcell
4XXX	C	0.008 In (±0.001 in)	0.008 In (±0.001 in)
	E, F	0.006 In (±0.001 in)	0.006 In (±0.001 in)
	D	0.022 In (±0.001 in)	0.022 In (±0.001 in)

Table 4-7: Overload Stop Gap Specifications for 4XXX

Factory No.	Position (Figure 4-2)	Gap (Tolerance) w/15472900A Loadcell
5XXX	C	0.016 In (±0.001 in)
	E, F	0.008 In (±0.001 in)
	D	0.022 In (±0.001 in)

Table 4-8: Overload Stop Gap Specifications for 5XXX

Shift Test

The shift test should be performed after calibration. Before starting the shift test, make sure the scale is level and does not rock. Place 10 lb of test weight (for 8270-4XXX) on the scale platter at point A, as shown in Figure 4-3. Proceed with the test at points B through E, as shown in Figure 4-3. Points B through E are midway between the center of the platter and the edge of the platter. The NIST H-44 acceptance tolerance is +/- 0.015 lb of any of the points B through E compared to A.

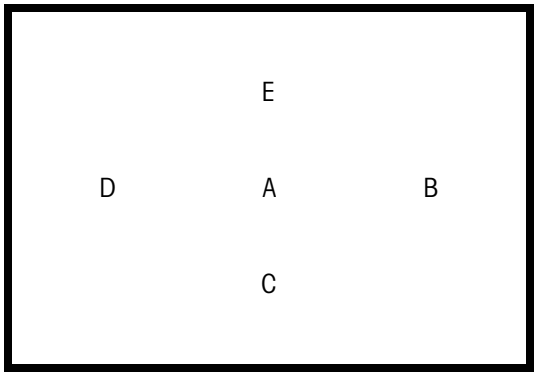


Figure 4-3: Shift Test

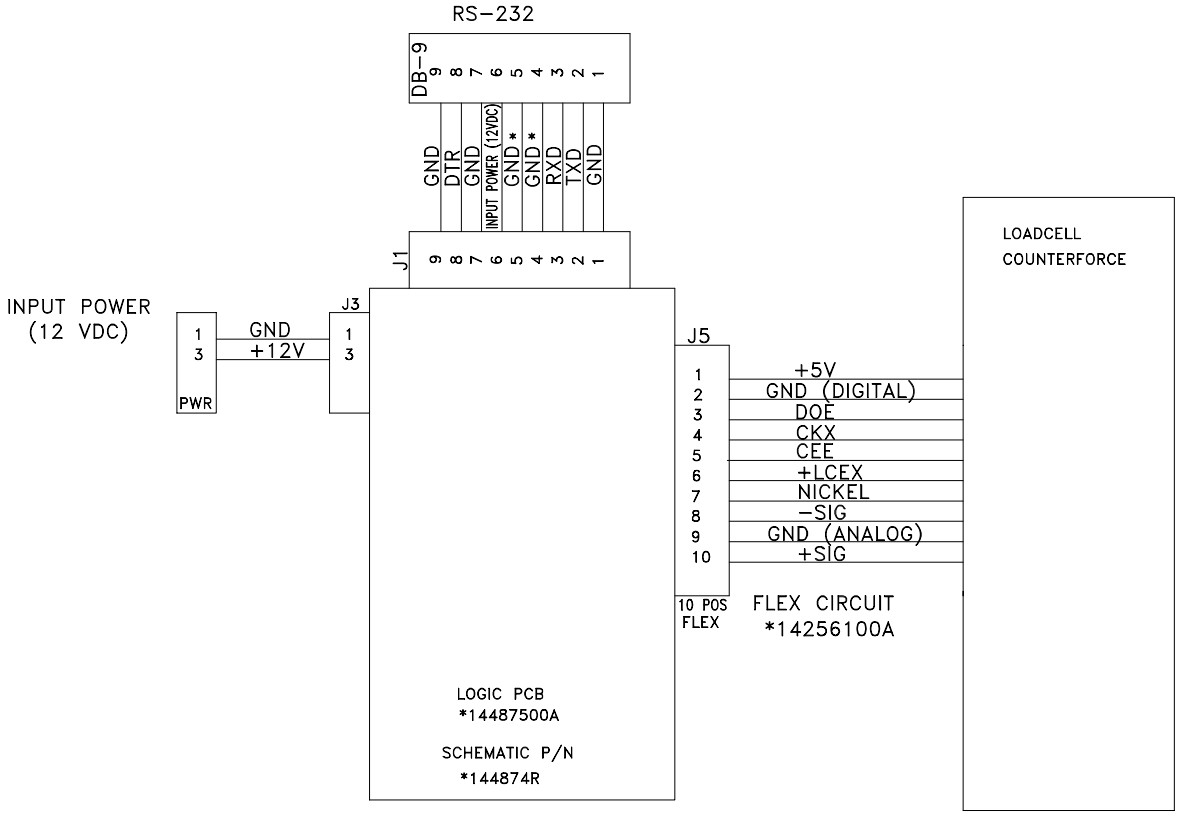
If any of the points are outside of the tolerance range, recalibrate the scale and perform the shift test again. If after recalibration, the tolerance is outside of the acceptable range, replace the load cell.

If the scale fails the meet the specified tolerance at one or more test points, check the following:

- Check load cell overload stop screws for proper adjustment.
- Check the platter for proper seating and possible interference.

If none of the above conditions exist, replace the load cell, recalibrate the scale, and recheck the shift.

Interconnecting Diagram

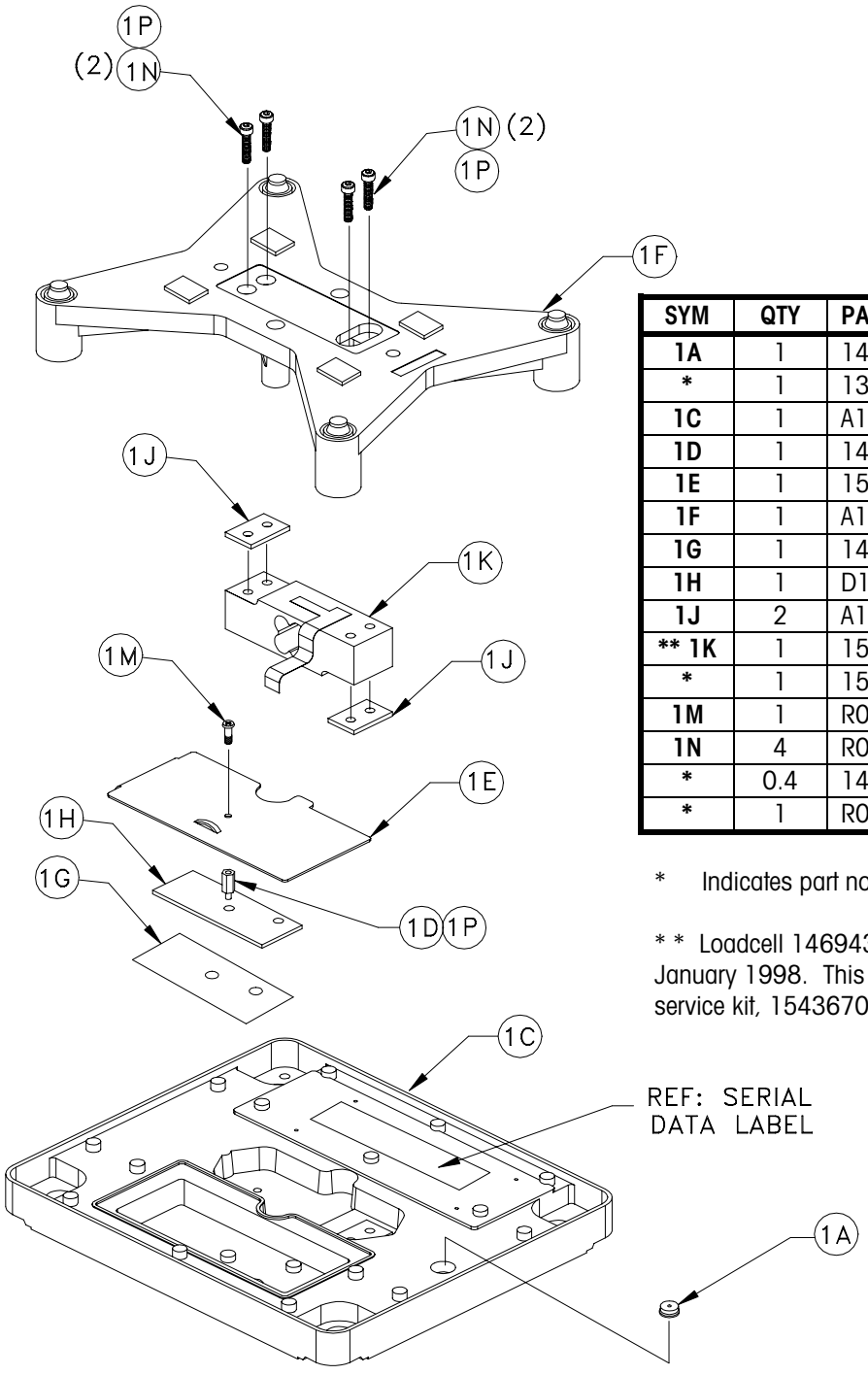


* Jumper W2 must be shorted to internally connect pins 4 and 5 to ground.

Figure 4-4: Interconnecting Diagram

5 Replacement Parts

Model 8270-3000

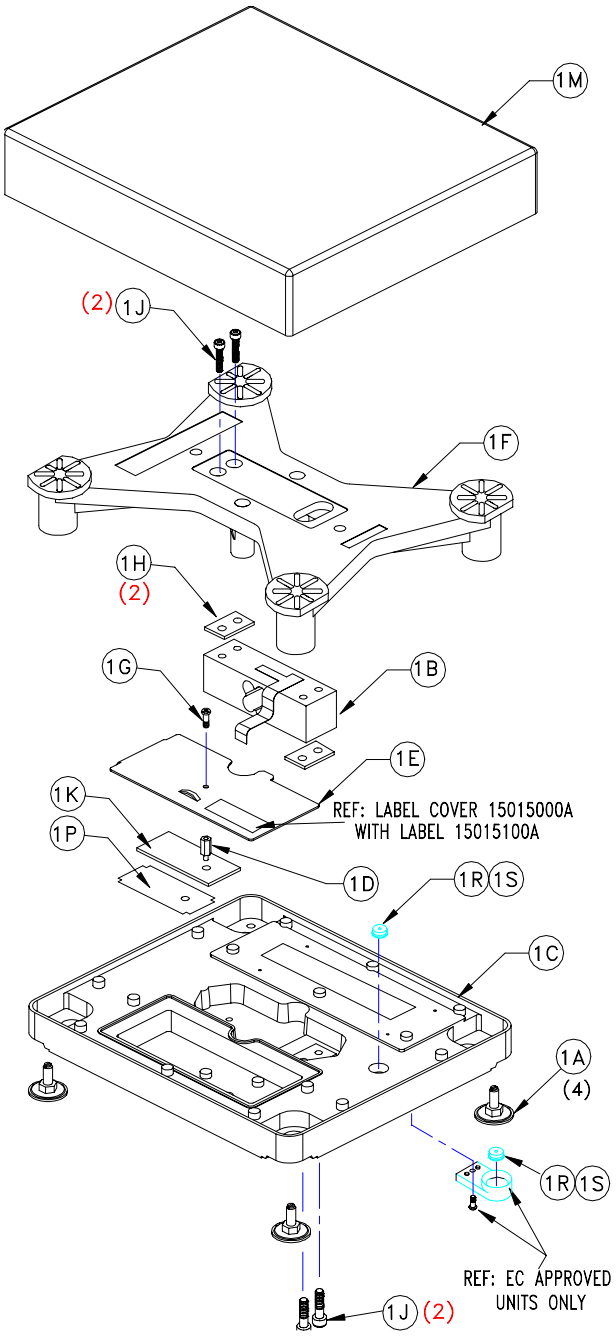


SYM	QTY	PART NO.	DESCRIPTION
1A	1	14813500B	Level
*	1	13786200A	Poly Bag 18 X 18
1C	1	A14647800A	Base Machined.45KG
1D	1	14497000A	Standoff, Hex .313x.591
1E	1	15015000A	Cover Plate
1F	1	A14663600A	Spider Assembly
1G	1	14616100A	Insulator
1H	1	D14637100A	Logic PCB, HiRes
1J	2	A14647700A	Insulating Spacer
** **1K**	1	15213800A	L/C Assy, 100KG
*	1	15015100A	Label, 8270-3000
1M	1	R0514600A	Screw, M4x8 Hex Drilled
1N	4	R0517600A	Screw, Cap M8x30 SOC
*	0.4	142128R	Spec, Tape Acrylic Foam
*	1	R0248100A	Washer, FI# 10X3/8 SS

* Indicates part not shown.

* * Loadcell 14694300A used in scales produced before January 1998. This loadcell cannot be replaced. Must order service kit, 15436700A

Model 8270 1XXX, 2XXX, 5XX0 and 6XX0



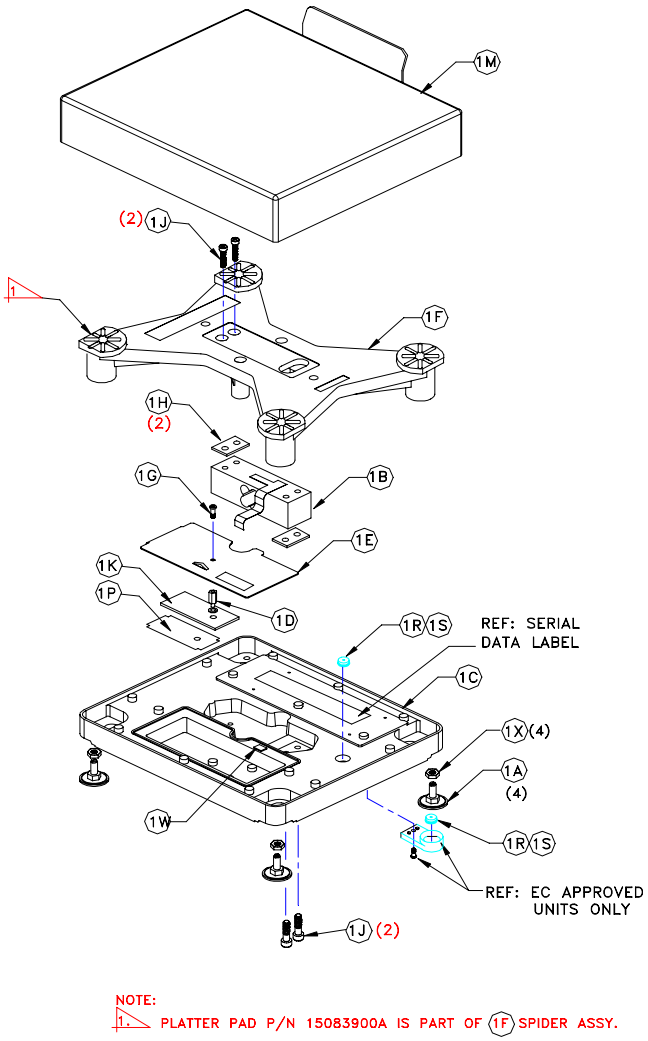
Model 8270-5XXX and 6XXX

SYM	QTY	PART NO.	DESCRIPTION
1A	4	14629400A	Adjustable Foot
1B	1	15472900A	Load Cell, 45kg (5XXX)
	1	15238900A	Load Cell, 100kg (6XXX)
1C	1	A14647800A	Base, Machined 45kg
1D	1	14497000A	Standoff, Hex M4, 16mm
1E	1	14544000A	Cover Plate
1F	1	B14544100B	Assy., Spider 8270
1G	1	R0514600A	Screw, M4x8 Hex Drilled
1H	2	A14647700A	Insulating Spacer L/C
1J	4	R0517600A	Screw, Cap M8x30 Soc
1K	1	D14637100A	PCB Assy., HiRes 8270
1M	1	14543200A	Assy.,Platter 8270 (5XXX)
	1	14543200D	Assy.,Platter 8270 (6XXX)
1N	1	14275100A	Label, 8270
1P	1	14616100A	Insulator, Logic PCB
1R	1	14813500B	Level
1S		146052R	Spec Adhesive 409
	1	13515600A	Power Supply, 120VAC to 12.5 VDC, 0.6A

Model 8270-1XXX and 2XXX

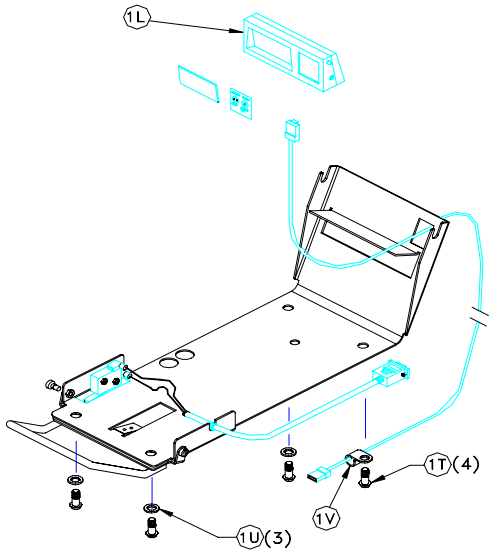
SYM	QTY	PART NO.	DESCRIPTION
1A	4	14629400A	Adjustable Foot
1B	1	15238900A	Load Cell, 100kg (2XXX)
1C	1	A14647800A	Base, Machined 45kg
1D	1	14497000A	Standoff, Hex M4, 16mm
1E	1	15015000A	Cover Plate
1F	1	B14544100B	Assy., Spider 8270
1G	1	R0514600A	Screw, M4x8 Hex Drilled
1H	2	A14647700A	Insulating Spacer L/C
1J	4	R0517600A	Screw, Cap M8x30 Soc
1K	1	D14637100A	PCB Assy., HiRes 8270
1M	1	14543200A	Assy., Platter 8270
1N	1	14275100A	Label, 8270
1P	1	14616100A	Insulator, Logic PCB
1R	1	14813500B	Level (2XXX)
	1	10268900A	Level (1XXX)
1S		146052R	Spec Adhesive 409

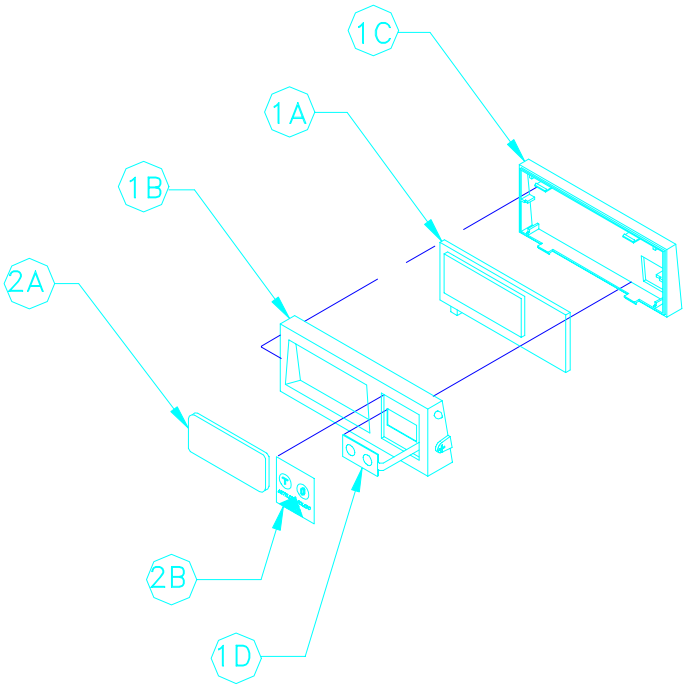
Model 8270-4XX2 and 5XX2



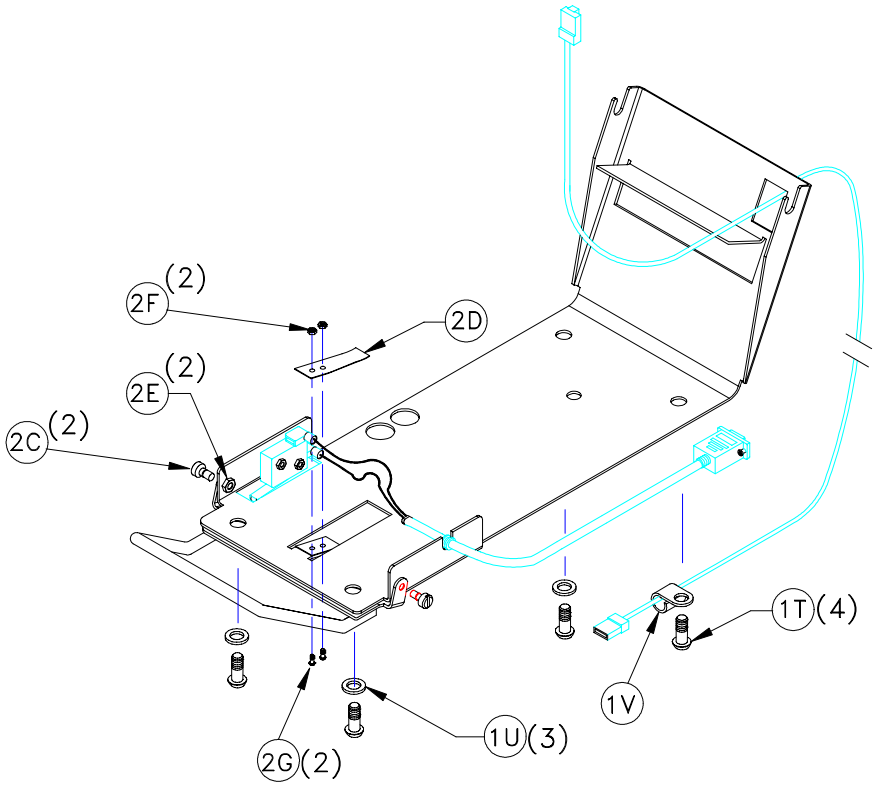
NOTE:
1. PLATTER PAD P/N 15083900A IS PART OF 1F SPIDER ASSY.

SYM	QTY	PART NO.	DESCRIPTION
1A	4	14629400A	Adjustable Foot
1B	1	15472900A	Load Cell, 45kg
1C	1	A14647800B	Base, Machined 45kg
1D	1	14497000A	Standoff, Hex M4, 16mm
1E	1	14544000A	Cover Plate
1F	1	B14544100B	Assy., Spider 8270
1G	1	R0514600A	Screw, M4x8 Hex Drilled
1H	2	A14647700A	Insulating Spacer L/C
1J	4	R0517600A	Screw, Cap M8x30 Soc
1K	1	C15205400A	PCB Ass'y., HiRes 8270
1L	1	A15196500A	Indicator Ass'y, 8270
1M	1	15116800A	Assy., Platter W/Backstop
1P	1	14616100A	Insulator, Logic PCB
1R	1	14813500B	Level
1S		145443R	Spec Adhesive 409
1T	4	R0513100A	Screw, Torx/Slot
1U	4	R0285100A	Washer
1V	2	12464300A	Cable Clamp, 0.188 DIA
1W	0.4″	142128R	Tape, Acrylic Foam
1X	4	R0356800A	Nut, 5/16-18 Zinc Plated
	1	13515600A	Power Supply, 120VAC to 12.5 VDC, 0.6A





SYM	QTY	PART NO.	DESCRIPTION
1A	1	14477200A	PCB Assy., Display
1B	1	A14248600B	Front Cover
1C	1	14248700B	Rear Cover
1D	1	A14249100A	Switch Membrane
1E	1	A15184900A	Switch Harness Tare
1F	1	14331600A	Harness, Display
1G	1	A15212200A	Assy., Bracket
1H	1	12161400A	Switch, Roller Lever
1J	2	R01982050	Screw, 4-40 x 5/8" PH
1K	2	R0363800A	Nut, 4-40 w/LW
2A	1	15185000A	Display Lens 20 x .005 lb
2B	1	14249200A	Overlay, Keyboard
2C	2	R0537300A	SCR,SHOULDER 8-32 SS
2D	1	15116900A	STRIP SPRING 8270-4XXX
2E	2	R0522900A	NUT W/LOCKWASHER, SS
2F	2	R0363800A	NUT 4-40 W/LOCKWASHER
2G	2	R01916050	SCR,4-40 X ¼ RH



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