2157

Installation
and
Service Manual

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

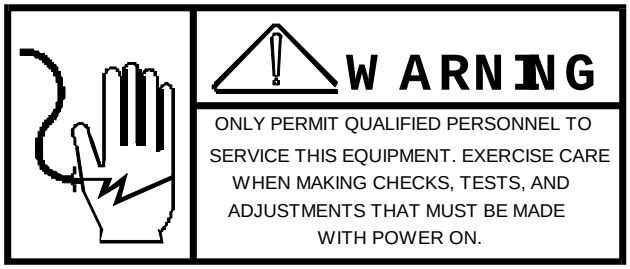
WARNING: This equipment generates, uses and can radiate radio frequency energy and if not installed and used properly, i.e., in accordance with the instructions manual, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for Class A computing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

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.

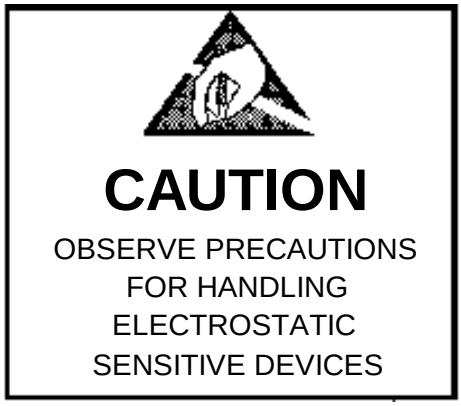


- **DO NOT** connect or disconnect a load cell scale base to the equipment with power connected or damage will result.

- **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.

CONTENTS

1.0 GENERAL DESCRIPTION

Model 2157 DigiTOL ® LIFTMATE™/ DECKMATE ® is a fully electronic low profile floor scale designed for a while variety of applications. Available in mild steel or all stainless steel construction, suitable for hostile environments, the Model 2157 provides a comprehensive product offering for today's industry.

Model 2157 DigiTOL ® LIFTMATE ™/DECKMATE® incorporates Toledo Scale's DigiTOL® Power Module, located in the scale understructure which replaces conventional junction box assemblies. Housed in a rugged stainless steel enclosure, the DigiTOL ® Power Module provides full software calibration, adjustment, and troubleshooting capabilities through the Mettler Toledo DigiTOL ® instrument; eliminating the need for time consuming "at scale" adjustments and troubleshooting. Model 2157 is fully compatible with the entire line of Toledo DigiTOL ® instruments, Complete analog versions of the entire 2157 floor scale line are available for installation with existing instrumentation or when it is appropriate to use an analog scale base.

LIFTMATE style scales are primarily designed for in-the-floor pit mount installations. LIFTMATE 's unique frame construction allows the user to utilize the scale frame as the pit coping, reducing installation time and the possibility of scale pits not being square or the right size.

DECKMATE® models are suited for top-of-floor installations and incorporate a formed angle frame with all sides turned under the scale platform. Model 2157 DECKMATE ® provides ramp access to all four sides of the scale. The DECKMATE ® can be used for pit type installations if separate pit coping is used, or for existing pit applications is scale pit opening size permits installation.

All Model 2157 DigiTOL ® LIFTMATE /DECKMATE ® floor scales incorporate Toledo's stainless steel shear beam load cells. A unique rocker pin/slider cup weighing suspension ensures that accurate weights will be delivered even in demanding installations.

DigiTOL ® LIFTMATE / DECKMATE ® floor scales are completely factory assembled and tested prior to shipment for high quality control and ease of installation.

2.0 HAZARDOUS AREA MODEL 2157 LIFTMATE™/DECKMATE®

DigiTOL® LIFTMATE™ /DECKMATE® floor scales are not suitable for hazardous area environments, as classified under NEC Article 500.

An optional analog 2157 LIFTMATE™ /DECKMATE® is available for hazardous area, or existing analog installations and is compatible with the entire line of Toledo analog instruments. See Appendix A, page 35, of this manual for details.

3.0 STANDARD SIZES AND SHIPPING WEIGHTS

3.1 MODEL 2157 DIGITOL® DECKMATE ®

Platform Size	Capacity		Model Number		Shipping Weight
	lb	kg	Mild Steel	Stainless Steel	
3' x 3'	2000	1000	215701302	215702302	325
	5000	2500	215701305	215702305	325
4' x 4'	2000	1000	215701402	215702402	450
	5000	25000	215701405	215702405	450
	10000	5000	215701410	215702410*	675
	20000	10000	215701420	----------	675
5' x 5'	2000	1000	215701502	215702502	600
	5000	2500	215701505	215702505	600
	10000	5000	215701510	215702510*	975
	20000	10000	215701520	----------	975
4' x 6'	2000	1000	215701602	215702602	575
	5000	2500	215701605	215702605	575
	10000	5000	215701610	215702610*	950
	20000	10000	215701620	----------	950
5' x 7'	10000	5000	215701710	----------	1300
	20000	10000	215701720	----------	1300

* Consult factory for shipping weights of 10K capacity stainless steel scales.

3.2 MODEL 2157 DIGITOL®LIFTMATE

Platform Size	Capacity		Model Number		Shipping Weight
	lb	kg	Mild Steel	Stainless Steel	
3' x 3'	2000	1000	215711302	215712302	425
	5000	2500	215711305	215712305	425
4' x 4'	2000	1000	215711402	215712402	575
	5000	25000	215711405	215712405	575
	10000	5000	215711410	215712410*	800
	20000	10000	215711420	----------	800
5' x 5'	2000	1000	215711502	215712502	775
	5000	2500	215711505	215712505	775
	10000	5000	215711510	215712510*	1100
	20000	10000	215711520	----------	1100
4' x 6'	2000	1000	215711602	215712602	800
	5000	2500	215711605	215712605	800
	10000	5000	215711610	215712610*	1100
	20000	10000	215711620	----------	1100
5' x 7'	10000	5000	215711710	----------	1475
	20000	10000	215711720	----------	1475

* Consult factory for shipping weights of 10K capacity stainless steel scales.

3.3 OPTIONAL DECKMATE® RAMPS

Ramp Width	Capacity (lb)	Mild Steel Treadplate	Model Number Stainless Steel Smooth Plate	Stainless Steel Tread Plate	Shipping Weight
3’	2000/5000	D13105	D13205	D13305	175
4’	2000/5000	D14105	D14210	D14310	225
	10000	D14120	D14210	D14310	225
	20000	D14120	---	---	225
5’	2000/5000	D15105	D15210	D15310	300
	10000	D15120	D15210	D15310	300
	20000	D15120	---	---	300
6’	2000/5000	D16105	D16210	D16310	350
	10000	D16120	D16210	D16310	350
	20000	D16120	---	---	350
7’	10000	D17120	---	---	420
	20000	D17120	---	---	420

4.0 SPECIFICATIONS

4.1 ACCURACY

Model 2157 floor scales meet or exceed the National Institute of Standards and Technology (NIST) Handbook 44 requirements for Class III scales.

4.2 LOAD CELLS

Toledo stainless steel shear beam load cells are provided in all standard capacity 2157 floor scales with 15 feet of integral 4/6 conductor, shielded, color coded cable. Load cell suspension utilizes the rocker pin/slider cup assembly (see Figure 4.2). individual load cell capacities used in the Model 2157 include:

Scale Platform Capacity (lb)	Capacity Per Each Load Cell (lb)	Minimum Useable (non-approved) Graduation size
2000	1000	0.2 lb
5000	3000	0.5 lb
10000	5000	1.0 lb
20000	10000	2.0 lb

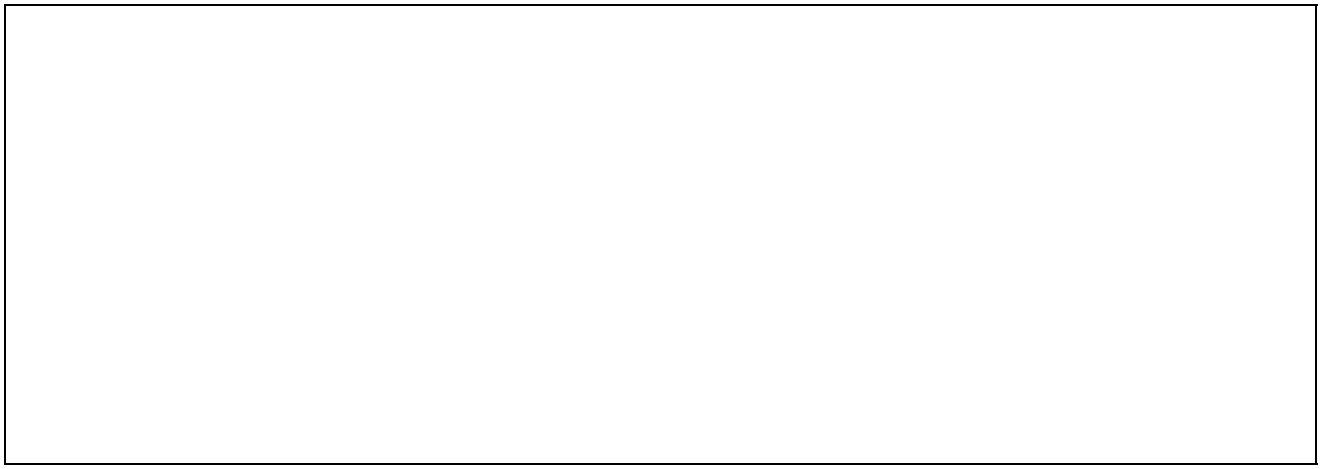


Figure 4.1 Load Cell Assembly Details
(Load Cell shown in Upright Position)

4.3 END LOADING

Model 2157 may be loaded up to 100% of the platform's full rated capacity or two times the individual load cell rating which ever is less, across any end of the scale.

4.4 PLATFORM ASSEMBLY

One piece continuous platform, channel reinforced construction with removable plate (mild steel scales only) to access the DigiTOL ® Power Module mounted within the platform structure. All mild steel scales are provided with treadplate surfaces. Stainless steel scale feature smoothplate construction

Adjustable platform bumper bolts are located on each side of the scale platform.

Provisions for platform removal are provided by threaded holes in the scale platform. Each scale is provided with the corresponding lifting eyebolts for convenience.

4.5 SUPPORT FRAME - DECKMATE®

DECKMATE® style platforms utilize a formed angle frame with all sides turned under the scale for a fully captured assembly (see Figure 4.6). DECKMATE® scales are primarily used for top-of-floor installations and can be used with optional ramps with access to all four sides of the scale.

DECKMATE® may also be used for in-floor applications when pit coping is used, however for best results, LIFTMATE™ style platforms are recommended.

4.6 SUPPORT FRAME - LIFTMATE™

LIFTMATE™ style platforms incorporate a unique frame which provides a unitized scale assembly while eliminating the need for pit coping when in-floor installations are required. Mild steel units are provided with a "C" type channel frame while stainless steel LIFTMATE™s use an inverted structural angle frame as standard (see Figure 4.2).

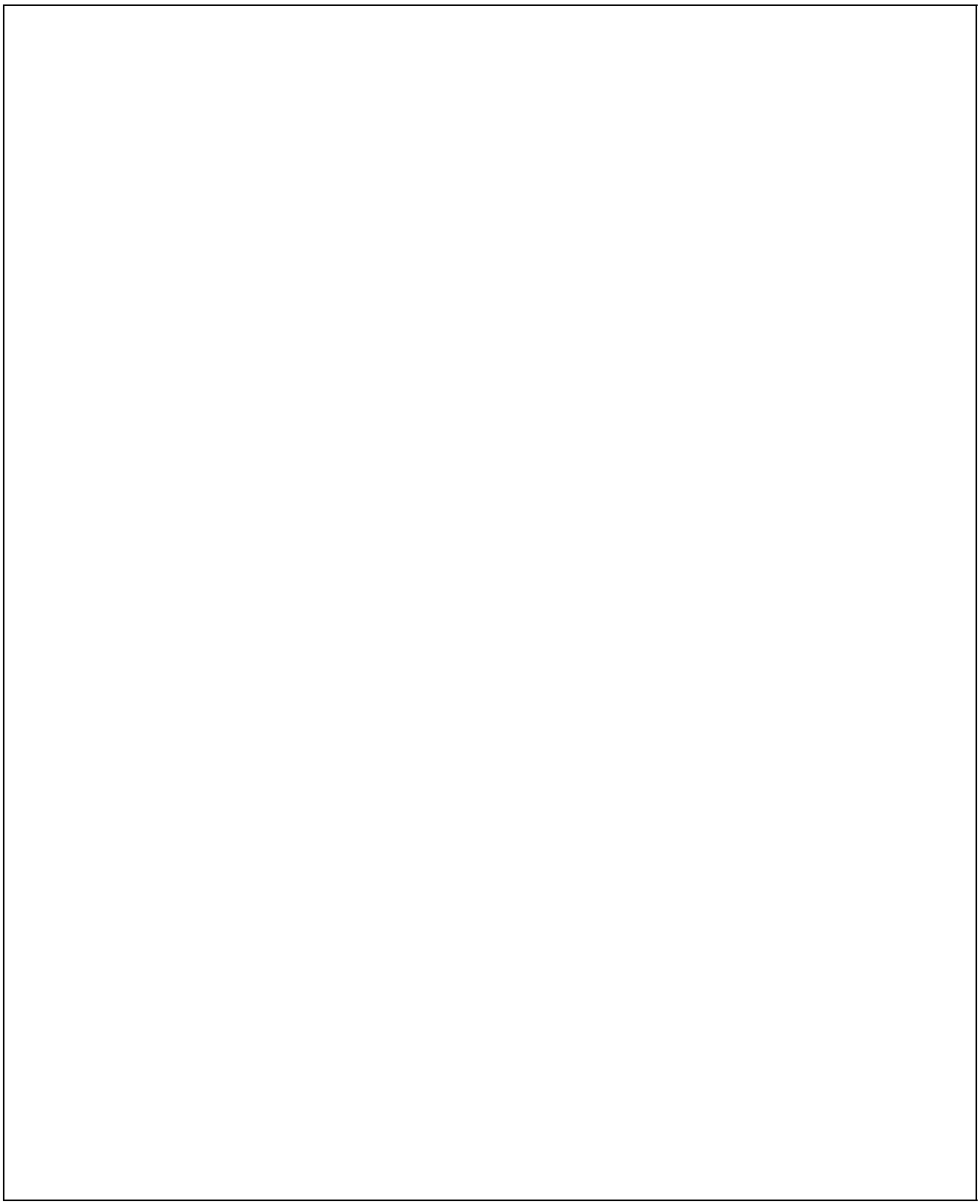


Figure 4.2 2157 Frame Types

4.7 POWER SUPPLY REQUIREMENTS

Load cell power supply is provided by the Toledo DigiTOL® instrument.

4.8 ACCESS RAMP ACCESSORIES

Access ramps are available for all styles of mils and stainless steel DECKMATE® floor scales for single or multi-directional traffic applications. Ramp length is 36" by the width of the scale. Maximum ramp angle is:

Capacity	Construction	Ramp Angle
2000/5000 lb	M.S.	5.0 degrees
10000/20000 lb	M.S.	6.8 degrees
2000/5000/10000 lb	S.S.	5.0 degrees

4.9 FORKLIFT CHANNEL ACCESSORIES

As standard all LIFTMATE™ scales from 2,000 through 10,000 pounds in capacity can be provided with forklift channels for portability. Forklift channels increase the overall height of the scale by at least 3" and provide a minimum of 2" clearance between the understructure and the top of the floor.

5.0 INSPECTION AND SITE SELECTION

5.1 INSPECTION

Upon delivery of the 2157 DigiTOL® LIFTMATE™/ DECKMATE®, visually inspect the scale for any damage which may have occurred during shipment and handling. Areas which should be inspected include:

5.1.1 Frame assembly for any warping or bent angles.
5.1.2 Load cell and suspension assemblies.
5.1.3 Load cell cables.
5.1.4 Overall platform assemblies.
5.1.5 DigiTOL® Power Module

If any damage is noted, contact your freight carrier immediately.

5.2 SITE SELECTION

Many problems associated with floor scale installations are caused by improper site conditions. Before installing the scale, check the proposed location for the following:

5.2.1 Is the area level with within 1/4" from highest to the lowest corner?
5.2.2 Is there proper drainage away from the scale area?
5.2.3 Are there any heavy vibrations or wind currents present near the scale?
5.2.4 Will the scale be subjected to excessive or unusual loading due to the location or type of equipment employed during normal use?

If the site location passes, proceed with installation. If it does not, choose a new area or reassess the application and select a correct scale size and capacity.

6.0 INSTALLATION - DECKMATE® (TOP-OF-FLOOR)

6.1 LOCATE

Place the 2157 DigiTOL® DECKMATE® in the desired location after inspecting the site per Section 5.0 of this manual.

6.2 REMOVE SHIPPING BRACKETS FROM THE SCALE

6.3 INSTALLATION (ANCHORING USING SHIPPING BRACKETS - NO RAMPS)

6.3.1 DigiTOL® DECKMATE® may be secured to the floor using the shipping brackets provided with the scale when ramps are not used. Or, if desired, the scale may be secured using the anchor holes located in the corners of the frame. The platform must be removed from the frame when using this method (see Section 6.4).

6.3.2 After removal of the shipping brackets, invert the angle and tighten to the frame via the bolts and threaded hold in the frame (see Figure 6.1). Bolt should be tightened to a minimum of 50 foot pounds of torque.

6.3.3 Locate each hole and drill all four anchor locations. Shipping bracket holes for anchoring are sized to accept 1/2" diameter anchor bolt. Drill holes to the diameter and depth per the supplier's instructions (anchor bolts by others).

6.3.4 Continue with Section 9.0 of this manual.

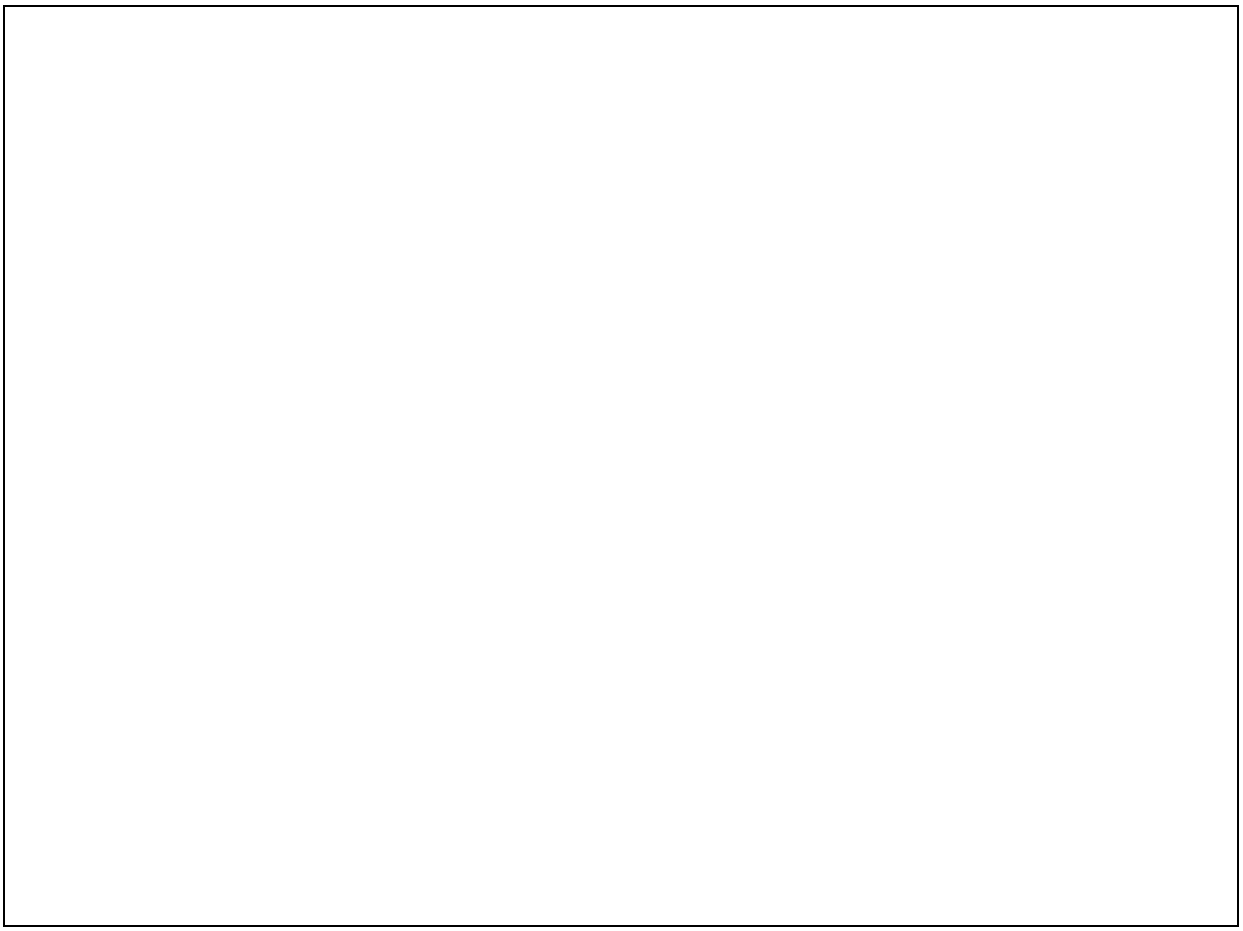


Figure 6.1 Shipping Bracket Locations

6.4 INSTALLATION (FOR USE WITH RAMPS)

6.4.1 Remove scale platform from the frame assembly utilizing the lifting eyes provided with the scale, ensuring that the lifting eyes have been installed snug and completely threaded onto the scale.

WARNING!!

IMPROPER INSTALLATION OF LIFTINH EYES WILL CAUSE FAILURE DURING LIFTING AND CAN CAUSE OHYSICAL INJURY AND/OR DAMAGE TO THE EQUIPMENT.

6.4.2 Locate the anchor holes in all four corners of the frame. There are a maximum of eight holes (2 per corner) in each DigiTOL® DECKMATE®.

6.4.3 Drill each of the anchor bolt holes, the 2157's frame is designed to accommodate up to eight (8) 1/2" anchor bolts. For scales which will be used with hand carts, or other non-motorized cares, a minimum of 4 anchors (one per corner) is required. For all other installations which may use motorized carts and/or forklifts, all eight anchors must be installed. Drill anchor bolt holes to the depth and diameter per the supplier's instructions (anchor bolts by others).

6.4.4 Level the DigiTOL® DECKMATE® platform by adding, or removing shims provided under each load cell (see Figure 6.2) in order to eliminate any rocking in the platform. Corners must be level to within ± 1/16" from corner to corner for proper installation.

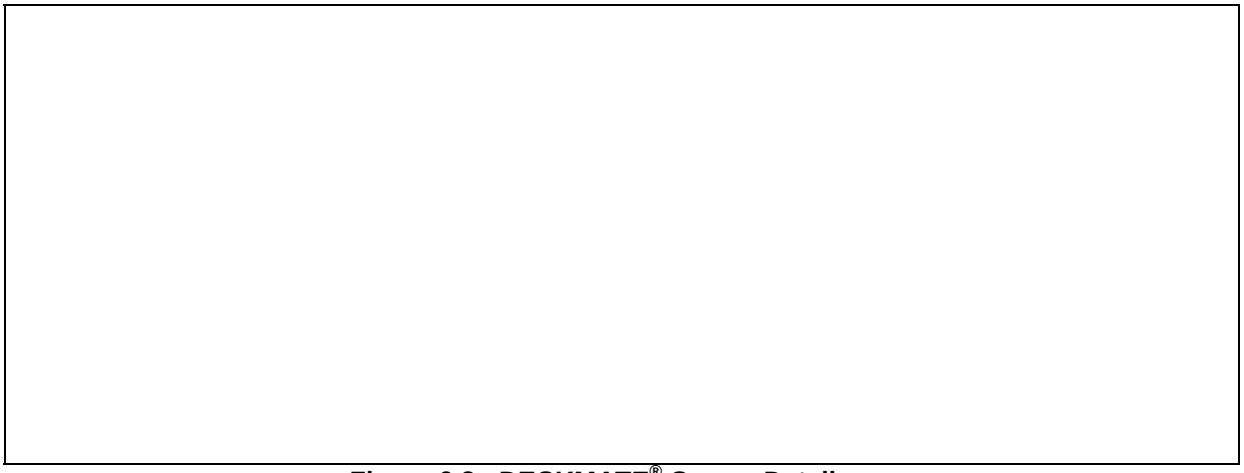
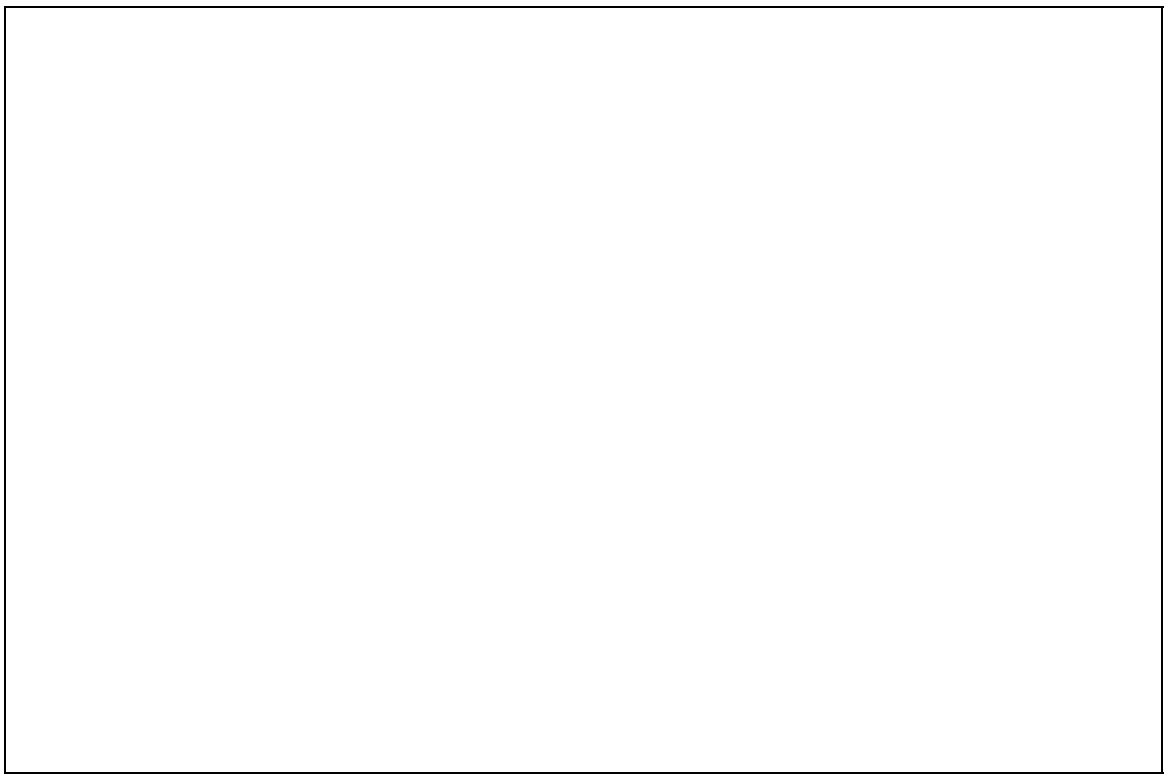


Figure 6.2 - DECKMATE® Corner Detail

NOTE: When reinstalling platform, ensure that the load cell slider cups are properly seated in check pates at each corner.

6.4.5 If out of level condition still exists after all load cell shims have been used, grouting or shimmings under the scale frame with shim plates may be required. Four 1/16" shim plates are provided with each DECKMATE®. If additional shims are required. Toledo P/N TA201196 may be ordered or field shims can be made from the template shim layout as shown in Figure 6.3

6.4.5 Secure the frame to the floor by using 1/2" anchor bolts, as per the anchor bolt supplier instructions (anchor bolts by others).



Scale Type	Use Holes
2157 DM Mild Steel 2 - 5 k	A & D
2157 DM Mild Steel 10-20k	B & C
2157 DM Stainless Steel 2-10k	A & C
2155 1000 Series 1-5k	A & D
2255 1000 Series 10k	N/A
2255 1000 Series 20k	B & C

All dimensions in inches.

Figure 6.3 Universal Corner Shim

7.0 OPTIONAL RAMP INSTALLATION

1. All Model 2157 DigiTOL® DECKMATE® Floor Scales are ramp accessible from all four sides. Select which side(s) of the scale platform is to have a ramp attachment.

2. Prior to reinstalling the platform and after the frame is anchored to the floor, locate the three holes on the side of the scale frame where the ramp is to be attached.

3. Each ramp is shipped complete with an attachment kit of parts which consists of (3) 3/4" -10 heavy hex bolts, (3) sleeve spacer bushings, and (3) 3/4" -10 jam nuts. The kit is typically fastened to the underside of the ramp for shipment.

4. Insert the 3/4" bolt through the sleeve spacer and into the exterior side of the scale frame.

5. On the interior side of the DECKMATE® scale frame, tighten the 3/4" jam nut to the protruding 3/4" bolt to a minimum of 100 foot pounds of torque (see Figure 7.1). It is recommended that "Loctite" or an equivalent thread locking product (provided by others) be used to ensure a long lasting tight fit.

6. Slotted ramp front plates are used as a pressure fit type connection. LIFTMATE the slotted front plate of the ramp over and past the 3/4" bolt head and lower so that the ramp's front plate rests between the bolt head and the scale frame.

7. Check to make sure that the ramp is stable and level from side to side and end to end. Shim under corners if required.

8. Proceed with platform installation.

NOTE: When reinstalling the platform, ensure that load cell slider cups are properly seated in check plates at each corner.

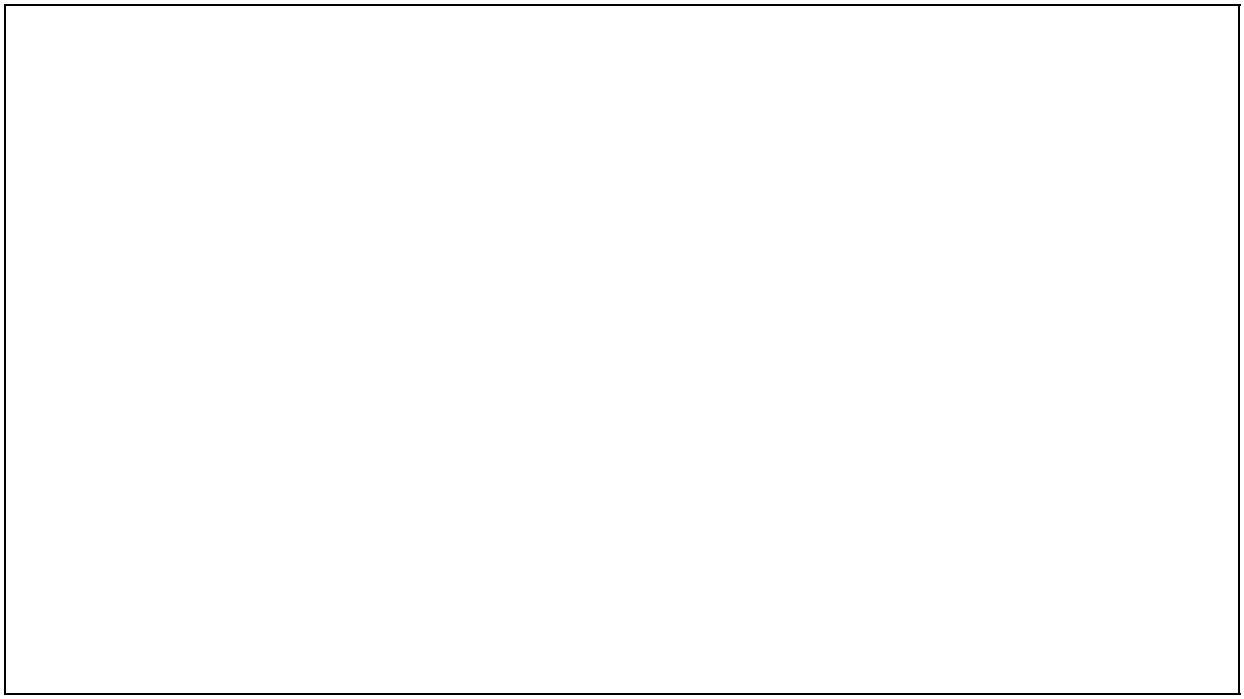


Figure 7.1 - Ramp Attach Detail
(Typical 3 places per ramp)

8.0 LIFTMATE™ PIT CONSTRUCTION

1. Prior to pit construction, contact Mettler Toledo Scale or an authorized Mettler Toledo Distributor to obtain the latest applicable pit construction drawings.

2. Remove the existing floor to dimensions which are at least 3” larger on each side and 2” deeper than the frame.

3. Slope the bottom of the pit at least 1/4” per foot towards the center of the scale, add the appropriate drainage to the center of the pit.

4. Add load cell cable conduit. Use a high grade steel conduit (1-1/4” EMT thin wall conduit minimum, supplied by others). Do not secure until after the frame is in correct position.

5. Reverse the shipping brackets on the LIFTMATE™ frame so they extend outward from the frame. Remove the weighing platform at this time (see Figure 8.1).

6. Place the frame into the pit, letting the shipping brackets bear against the existing floor (see Figure 8.1).

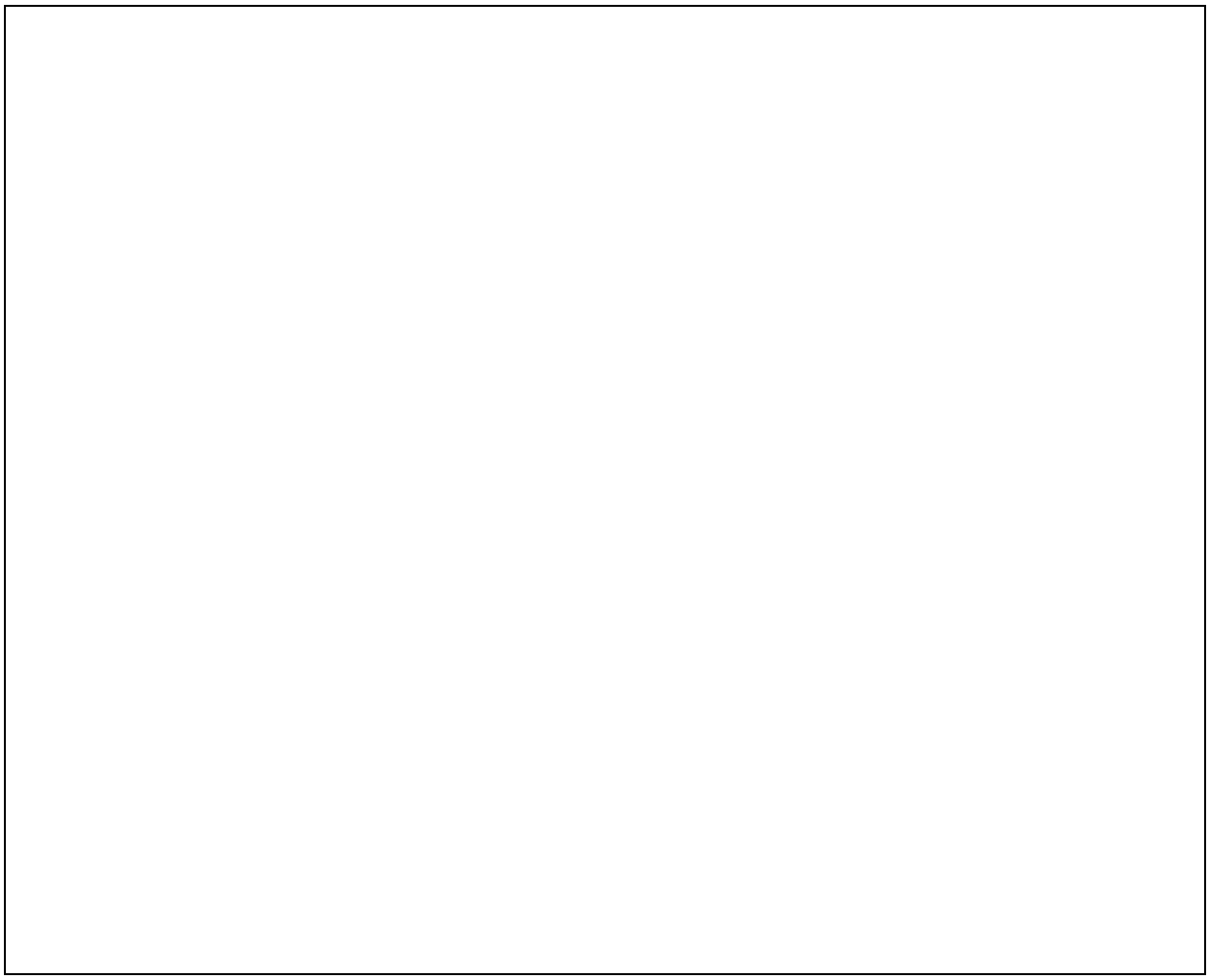


Figure 8.1 - LIFTMATE™ Shipping Bracket

7. Level the frame by shimming the shipping brackets on the existing floor.

8. Secure the load cell cable conduit to the frame.

9. Mask the four load bearing corners of the scale frame to keep them clean. Also, for best results, mask the top edge of the frame prior to pouring to protect the exterior scale finish.

10. Using high quality non-shrinking grout rated at 5000psi minimum, grout beneath corner base plates. Slope the base area grout at least 1/4 per foot for adequate drainage. Ensure that the grout is packed under and in full contact with the four corner base plates on the frame.

11. Allow the grout to cure per the grout manufacturer's instructions.

12. Once the grout has setup, backfill the gap remaining around the perimeter of the frame with concrete until level with the floor and frame. Allow the concrete to cure per the supplier's instructions before proceeding further.

9.0 INSTALLATION - WEIGHING PLATFORM

1. Clear all debris from the scale area. Ensure that all four load points on the frame are clean and clear of all foreign material.

2. Route the instrument cable through the scale frame and into the scale platform. A minimum of ten feet of cable should protrude into the scale pit for LIFTMATE™ type installations.

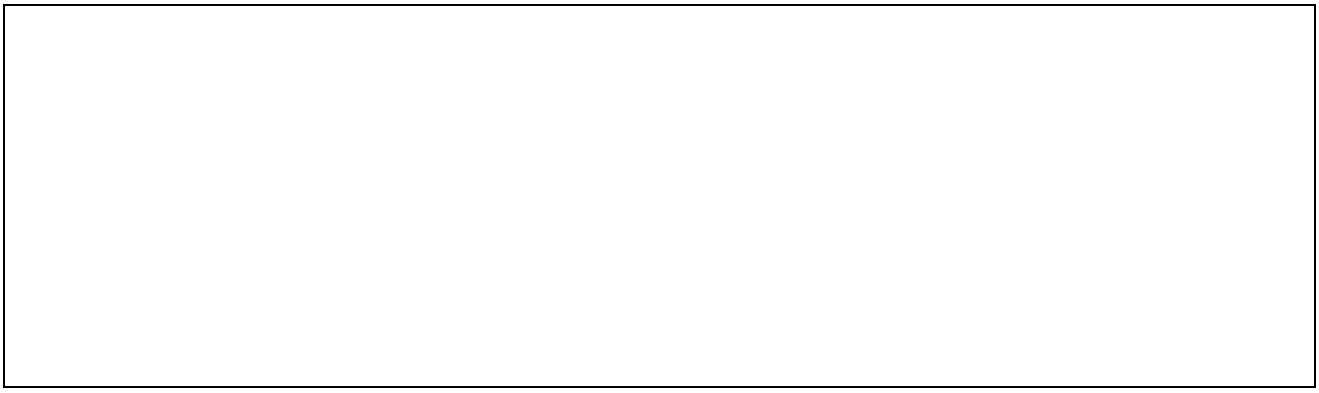
3. Install the instrument cable per instructions listed in one of the following sections:
   - Section 10.0: Mild Steel Scales with 8505 Weight Display
   - Section 11.0: Mild Steel DigiTOL® Scales, all other DigiTOL® instruction.
   - Section 12.0: Stainless Steel DigiTOL® Scales.
   - Appendix A: Analog Style Model 2157 Scales.

4. Replace the platform into the frame making sure there is slack in the cable between the frame and platform so as not to pinch the cable or interfere with weighing accuracy.

NOTE: Ensure that load cell slider cups are properly seated in check plates at each corner.

5. Check to make sure there is an even and continuous clearance between the frame and the weigh platform on all four sides.

6. Check stability of the platform by testing all four corners of the scale. If the platform rocks and is not stable, remove the platform and use shims provided to eliminate the instability (see Figure 9.1).



NOTE: When installing platform, ensure that load cell slider cups are properly seated in check plates at each corner.

Figure 9.1 LIFTMATE ™ Corner Detail

7. Stand on the scale and oscillate the platform several times in all directions against the bumpers in order to align the load pins of the suspension system.

8. Check the bumper bolt clearance. Distance between bumper bolts and scale frame should be 1/16". If this is not the case, remove the platform and add or delete washers as required (see Figure 9.2) until the clearance is correct. Bumper bolts are located on the side of the scale platform approximately 8" to 10" in from the corners.

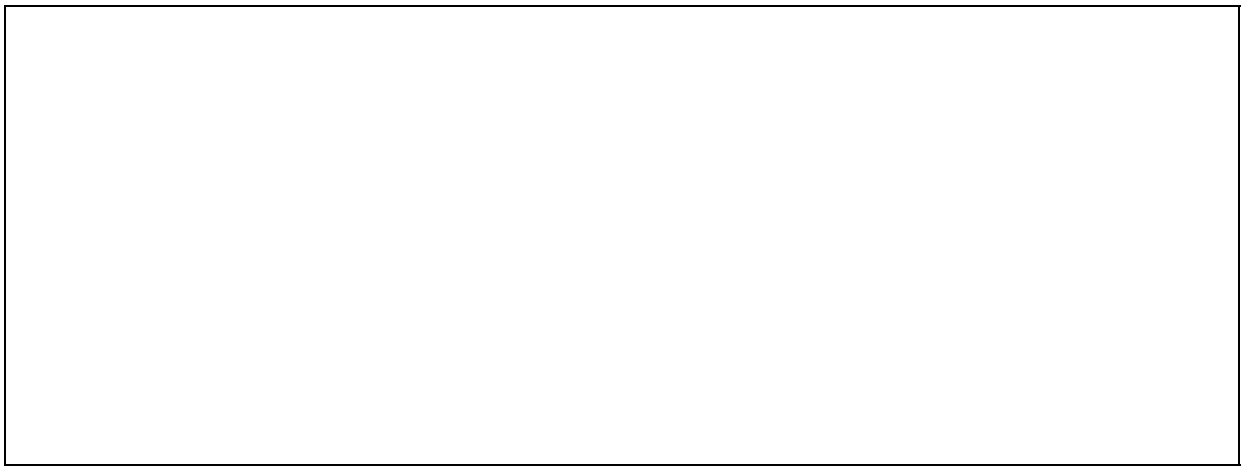


Figure 9.2 Bumper Bolt Details

9. Calibrate the scale per the instrument manual.

10.0 INSTRUMENT CABLE INSTALLATION - MILD STEEL SCALES WITH 8505 WEIGHT DISPLAY ONLY.

1. Remove the Power Module Access plate from the scale platform.
2. Remove the Power Module cover. Loosen, remove, and discard the existing instrument cable cord connector from the Power Module, retain the lock nut.
3. The 8505 Weight Display is provided with an integrally wired 25' cable which has its own Power Module cord connector and 16-pin pre-wired interface connector. (See Figure 10.2)

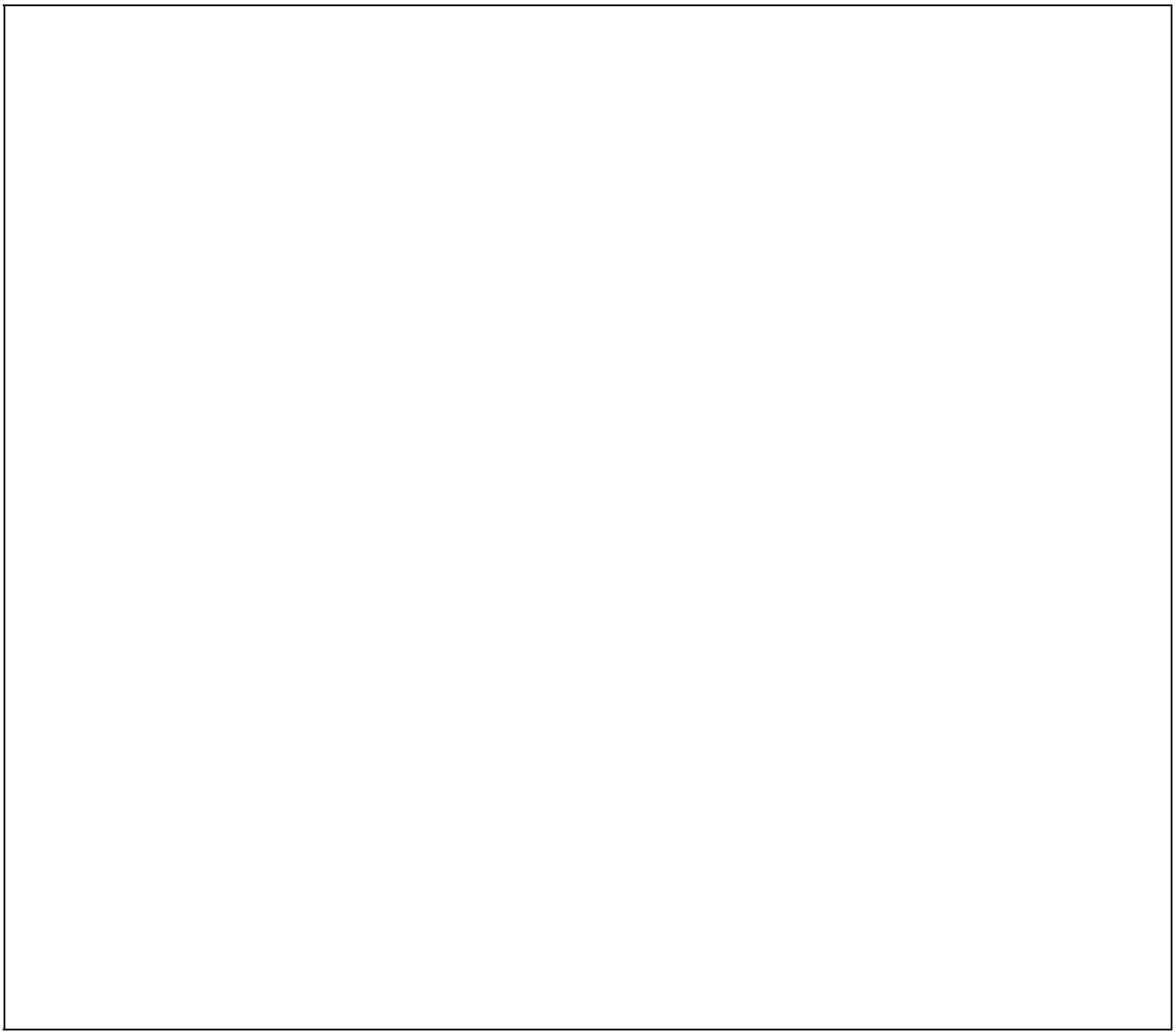


Figure 10.1 Instrument Cable Access Locations

4. Thread the instrument cable through the hole provided in the frame and platform, stopping at the Power Module assembly (see Figure 10.1)

5. Utilize the existing interior nut from the cord connector assembly, install the 8505's integral cord connector assembly to the 2157 Power Module and tighten securely (see Figure 10.2).

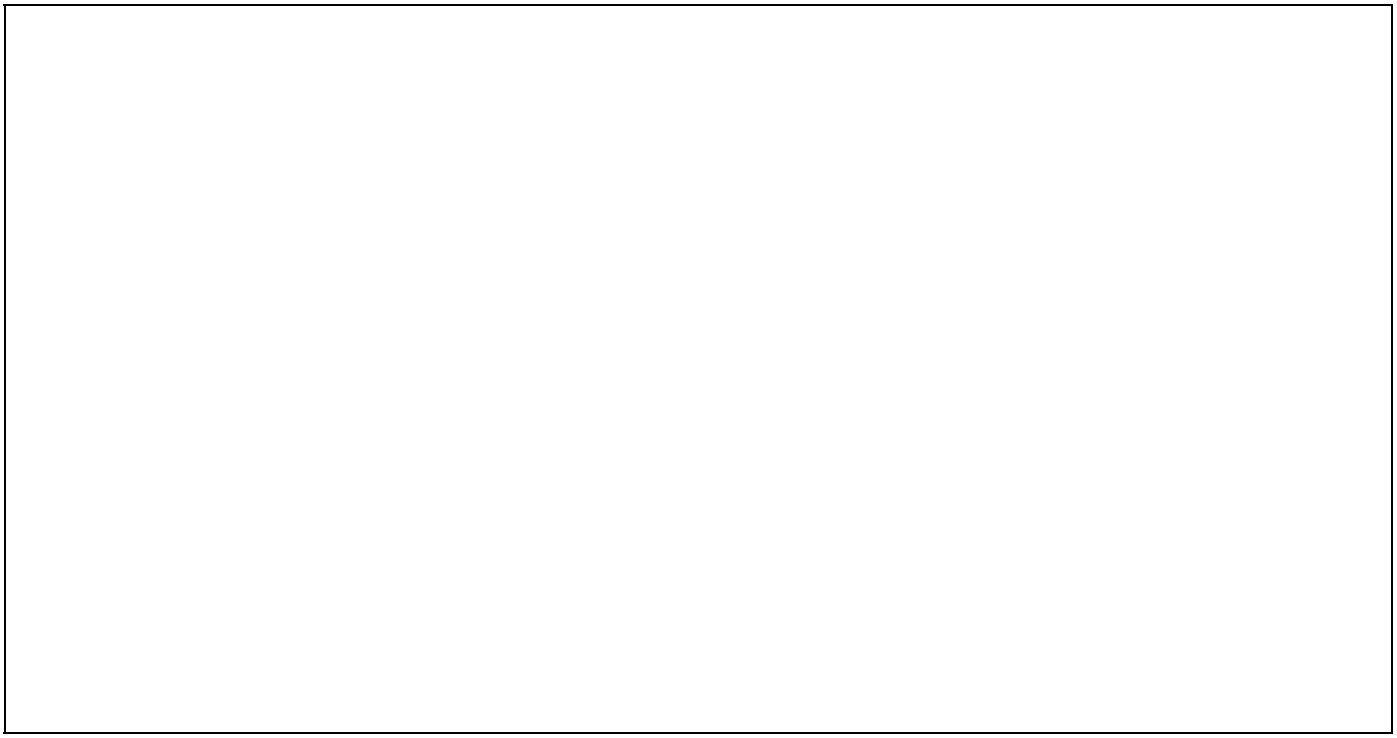


Figure 10.2 - Cord Connector Assembly

6. Install the 8505's keypad 16-pin connector into terminal connector J1 on the Power Module PCB (see Figure 11.1).

7. Place desiccant bag inside Power Module.

8. Reinstall the Power Module cover. Make sure that the rubber gasket is clean, correctly located, and sealant is applied to the contact surface of the gasket. Tighten all screws.

9. Reinstall Power Module access plate and tighten.

10. Calibrate the scale following the Mettler Toledo DigiTOL® instrument panel.

11.0 INSTRUMENT CABLE INSTALLATION - MILD STEEL DIGITOL®

1. Follow these instructions if utilizing Mettler Toledo 8510, 8520, 8530, 8572, or 8582 DigiTOL® instruments.

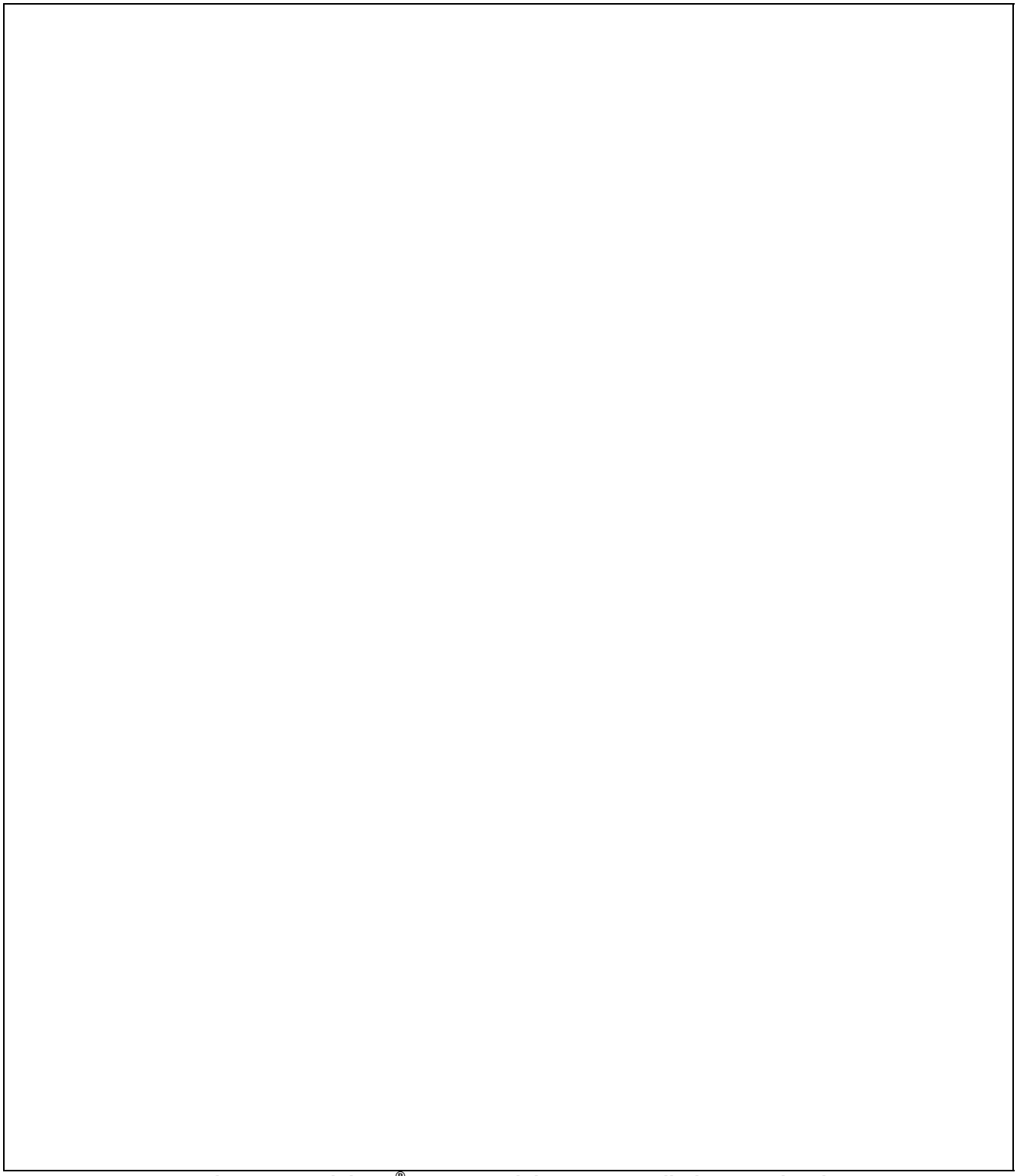


Figure 11.1 DigiTOL® Power Module J-Box Details (Connections)
(Top view with J-Box lid removed)

2. Remove the Power Module access plate from the platform.

3. Thread the instrument cable through the hole provided in the scale frame and platform, stopping at the Power Module (see Figure 10.1).

4. Remove the Power Module cover. Loosen and remove the instrument cable connector, thread the cable through the connector, reinstall, and tighten (see Figure 11.2).

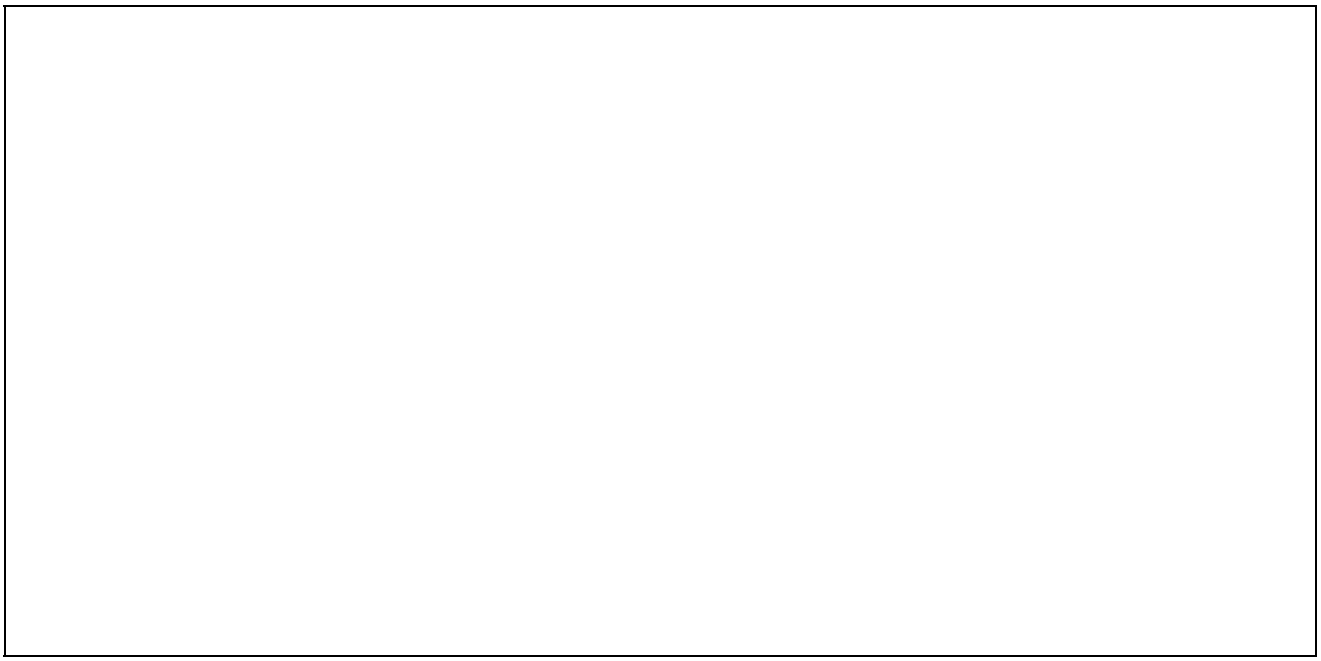


Figure 11.2 - Cord Connector Assembly

5. Wire the instrument cable to terminal connector TB5 on the Power Module PCB using the following format (see Figure 11.1).

Terminal	Function	Suggested Color Code
1	T x D (A)	Black
2	T x D (B)	Yellow
3	R x D (A)	Red
4	R x D (B)	White
5	Ground	Blue
6	+20V	Green

Connect shield wire to the Power Module PCB mounting screw, utilizing a 310 ring terminal.

6. Place desiccant bad inside Power Module.

7. Reinstall the Power Module cover. Make sure that the rubber gasket is clean, correctly located, and sealant applied to the contact surface of the gasket. Tighten all screws.

8. Reinstall the Power Module access plate and tighten.

9. Calibrate the scale following Mettler Toledo's DigiTOL® Instrument Manual.

12.0 INSTRUMENT CABLE INSTALLATION - STAINLESS STEEL VERSIONS

1. Stainless Steel 2157 Scales utilize a sealed Power Module located underneath and along the edge of the scale platform (see Figure 12.1).

2. Remove the scale platform from the scale and locate the Power Module assembly.

3. Thread the instrument cable through the hole provided in the scale frame and platform to the Power Module assembly (see Figure 10.1).

4. DO NOT OPEN THE POWER MODULE (JUNCTION BOX), access to the interior of the 2157's DigiTOL® Power Module is not required for installation. A convenient 10-pin female water tight connector is provided on the side of the Power Module for ease of installation and moisture protection (see Figure 12.1).

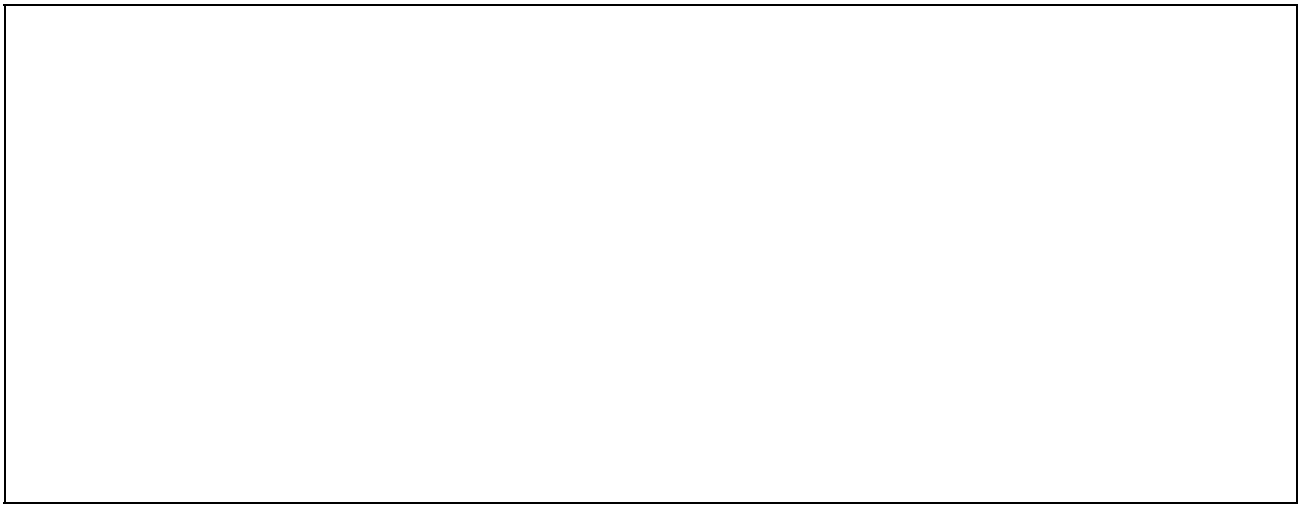


Figure 12.1 - Power Module J-Box Orientation

5. A 10-pin water tight connector is provided for installation on the instrument cable. Solder and pot the connector using the following wiring code (see Figure 12.2).

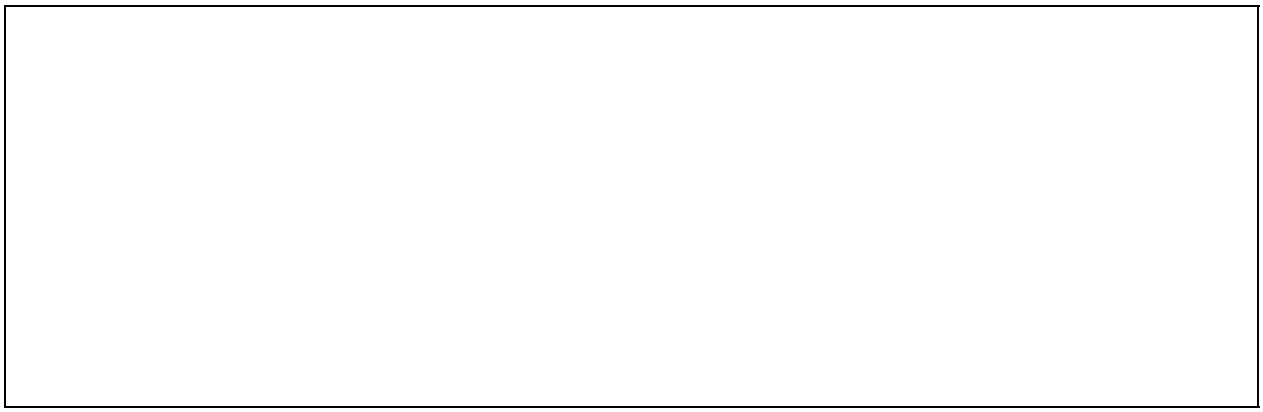


Figure 12.2 10 Pin Connector Wiring Detail

6. After the instrument cable has been attached, reinstall the scale platform. Remove any excess instrument cable from the frame as the scale is lowered in order to prevent scale binding or damage to the instrument cable.

7. Calibrate the scale following the Mettler Toledo DigiTOL® Instrument Manual.

13.0 ROUTINE CARE AND MAINTENANCE

13.1 GENERAL

Once the scale is installed, it is recommended that the assembly be periodically inspected and calibrated by an authorized Mettler Toledo Scale Service Representative even though there may be no apparent defects or weighing errors noticed. If the scale is used for legal-for-trade purposes, consult the local Weights and Measures Authorities for minimum inspection requirements. Specific installations and scale usage generally dictate how often the scale should be inspected. Contact you local authorized Mettler Toledo Scale Service Representative for information on periodic inspection and calibration services.

13.2 SITE INSPECTION

Ensure that the scale site remains a good place for weighing. Check for alterations in the surrounding floor, excessive vibrations, wind currents, and possible abnormal or high loading conditions.

13.3 PLATFORM INSPECTION

During a periodic inspection of the scale assembly the following areas should be noted.

1. Is there any unusual wear points, paths, or marks on the weighing surface?
2. Is the scale frame bent or damaged?
3. Is the DigiTOL® Power Module (or Analog junction Box) lid sealed properly and all cable connectors tight against the enclosure.
4. Is there any moisture or foreign material build-up around or inside the DigiTOL® DECKMATE® and LIFTMATE™s. DO NOT OPEN THE SEALED DigiTOL® POWER MODULE at this time.
5. Is the instrument cable free from damage or binding the scale platform?
6. Is there any debris or foreign material buildup under the scale platform which could inhibit its freedom of movement?
7. If a pit installation, is the floor drain clear and providing proper drainage?
8. Visually inspect the load cells and suspension hardware for signs of unusual wear.
9. Check all bumper assembles for proper clearance (1/16").
10. Perform shift adjustments and final calibration procedures per the Mettler Toledo DigiTOL® instrument manual instructions.

14.0 TROUBLESHOOTING - GENERAL

CAUTION!!
BEFORE CONNECTING/DISCONNECTING ANY INTERNAL 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.

If operational difficulties are encountered, first obtain as much information as possible regarding the problem. Is the problem intermittent or constant? Malfunctions can be caused by anything from poor installation work to loose wiring so be patient and use sound logic when troubleshooting.

14.1 LOCATION AND INSPECTION

When troubleshooting a 2157 DigiTOL® LIFTMATE™/ DECKMATE®, examine the physical location of the scale, checking for the presence of water, corrosive materials, unlevel floors, high vibrations or wind currents, excessive loading or physical damage to the scale platform or frame assembly. Also check the instrument cable for possible damage plus connected of the instrument cable to the DigiTOL-® instrument and Power Module for loose wiring.

14.2 ISOLATE - 2157 WITH 8505 WEIGHT DISPLAY

Next determine if the problem is in the scale platform or 8505 Weight Display. After removing power from the system, either replace the 8505's printed circuit board (PCB) or replace the entire 8505 Weight Display unit with a

unit known to be working properly Weight Display and calibration parameters are stored in the 2157's DigiTOL® Power Module when used with the 8505 Weight Display.

Reapply power to the system once the new 8505/PCB has been installed and observe if the problem is corrected. To verify the problem was in the 8505, reinstall the original PCB and see if the problem returns.

If the problem is not corrected by 8505/PCB replacement, further scale platform troubleshooting will be required.

14.3 ISOLATE - 2157 WITH OTHER DIGITOL® INSTRUMENTS

When used with any of the other Mettler Toledo DigiTOL® instrument (i.e. 8510, 8520, 8530, 8572, 8582), you may determine whether the problem is in the instrument or platform by using a Mettler Toledo DigiTOL® simulator. After removing power from the system, disconnect the DigiTOL® instrument from the 2157 scale assembly and connect the DigiTOL® simulator to the instrument. Reapply power. If the problem is still present, consult the DigiTOL® instrument manual for further troubleshooting assistance.

If the problem is not present, remove power, disconnect the simulator and reconnect the scale platform. If the problem reoccurs, further scale platform troubleshooting may be required.

14.4 CHECK WIRING - MILD STEEL 2157 DIGITOL® FLOOR SCALES

1. Remove the access cover plate and DigiTOL® Power Module cover. Be sure that the interior of the Power Module is clean and dry.
2. Be sure that the 8505 connector is firmly secured in terminal location J1 on the PCB or if another DigiTOL® instrument is used, that Terminal TB5 is secured properly to the PCB (see Figure 14.1)
3. If terminal TB5 is used, check the individual wired for loose or incorrect wiring (see Figure 41.1), correct wiring code is:

Terminal	Function	Suggested Color Code
1	T x D (A)	Black
2	T x D (B)	Yellow
3	R x D (A)	Red
4	R x D (B)	White
5	Ground	Blue
6	+20V	Green
(**)	Shield	---

(**) Shield should be terminated to one of the PCB mounting screws using a 310 ring terminal.

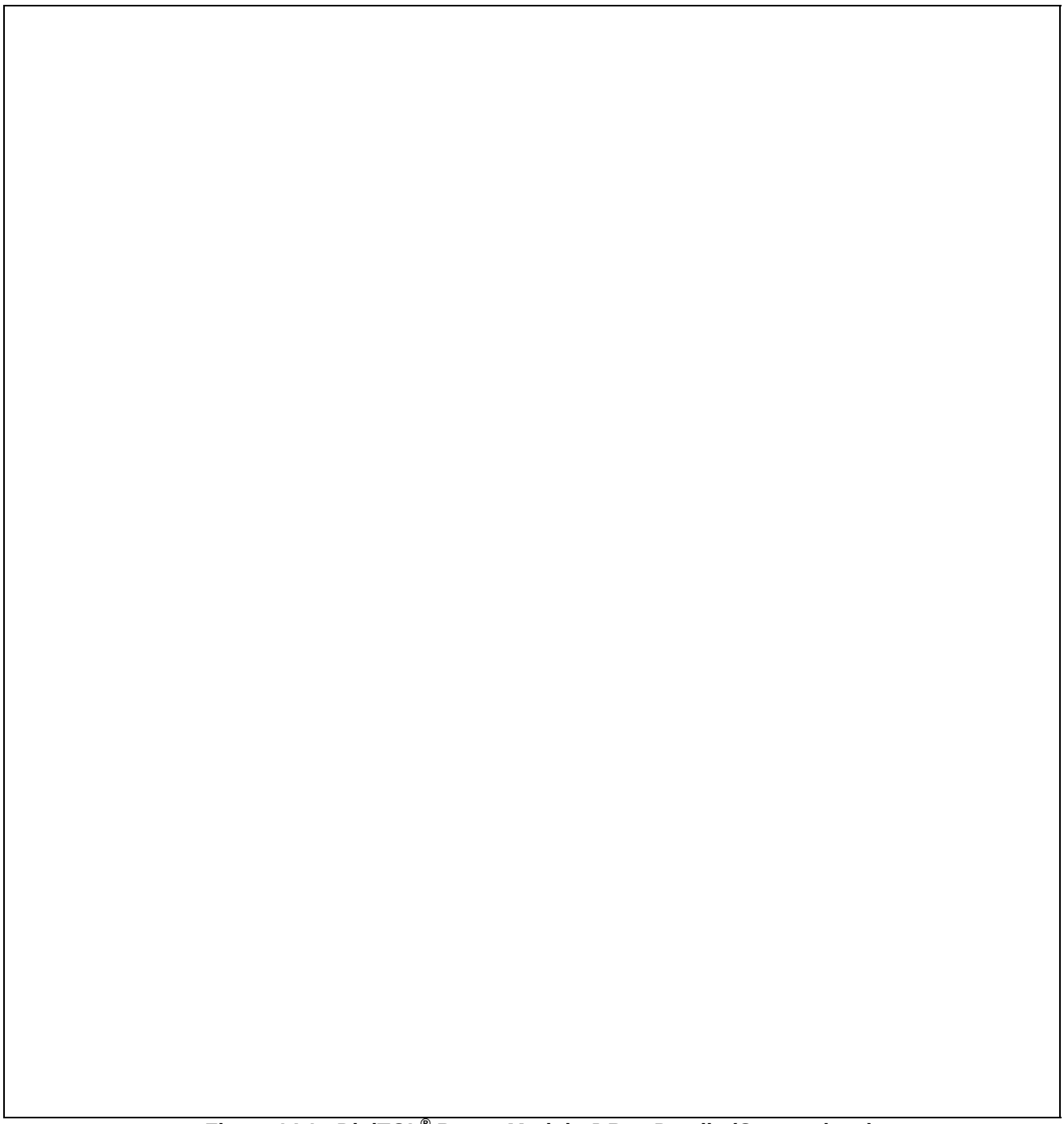


Figure 14.1 - DigiTOL® Power Module J-Box Details (Connections)
(Top view with J-Box lid removed)

4. Check load cell wiring terminals TB1 through TB4 for loose connections and correct wiring (see Figure 14.1). Correct wiring should be:

Terminal	Function	Suggested Color Code
1	- Excitation	Black
2	- Sense (not used)	(***)
3	- Signal	Red
4	+ Signal	White
5	+ Sense(not used)	(***)
6	+ Excitation	Green
(**)	Shield	Yellow

(**) Shield should be terminated to one to the PCB mounting screws using a #10 ring terminal.
(***) In a few isolated cases, long term stability may be improved by jumping terminal pins ! & @ together and 5 & 6 together. This only needs to be done on one (1) terminal strip TB1-TB4.

5. Check all other water tight cable connectors on the DigiTOL® Power Module. Tighten any found to be loose.

6. Reinstall the DigiTOL® Power module cover making sure that the cover gasket is clean and correctly located and sealant is applied to all gasket contact surfaces.

7. Reinstall Power Module access plate and tighten into position.

14.5 CHECK WIRING - STAINLESS STEEL 2157 DIGITOL®POWER SCALES

1. Lift platform out of the frame using the eyebolts provided with the scale assembly. Lift platform out far enough to access the instrument cable quick connector located on the exterior of the DigiTOL® Power Module.

2. Disconnect the cable and visually inspect the cable, connector, and DigiTOL® Power Module for potential damage, loose connections, or improper installation.

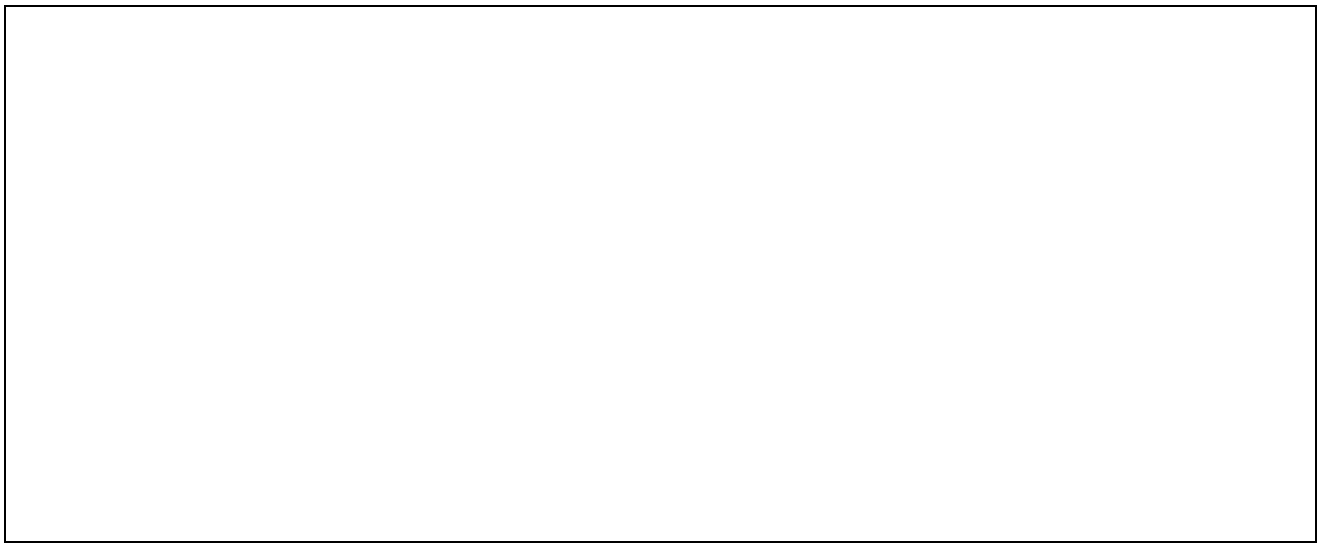


Figure 14.2 - 10 Pin Connector Wiring Detail

3. Inspect connector wiring. The 10-pin male connector should be wired as above (see Figure 14.2).

4. Inspect connector potting for deterioration; remove connector, rewire and repot if necessary.

5. DO NOT open the DigiTOL® Power Module. It has been prewired and sealed from the factory. Explore all other troubleshooting possibilities prior to opening the power module on stainless steel 2157's.

14.6 STAINLESS STEEL 2157 DIGITOL® POWER MODULE

NOTE: Unless a load cell or Power Module PCB is suspected to be defective, there is no need to access the interior of the Power Module on stainless steel DigiTOL® for installation, operation, normal care, or maintenance.

1. **General Information**
   An enhanced environmentally protected DigiTOL® Power Module is provided on all 2157 DigiTOL® stainless steel floor scales. The Power Module features a sealed stainless steel enclosure with water tight cable connector for instrument cable termination. The instrument cable is terminated without having to access the interior of the DigiTOL® Power Module.

   The DigiTOL® Power Module's Printed Circuit Board (PCB) is further encased in a protective potting compound for added protection against moisture, dirt, chemicals, or other potentially harmful materials. Load cell and instrument cable interface wiring is terminated to the potted PCB via quick connector terminal striped for added convenience.

   The entire DigiTOL® Power Module is mounted to the platform's underside. If incidental moisture or materials should make their way into the DigiTOL® Power Module's interior, the water or material will not reside on the potted PCB, since the Power Module is mounted upside down on the platform's underside.

   Unless a load cell or Power Module PCB is suspected to be defective, there is no need to access the interior of the Power Module on stainless steel DigiTOL® 2157's for installation, operation, normal care, or maintenance.

2. Once the platform has been removed and instrument cable has been inspected (see Section 14.5), remove the DigiTOL® Power Module's access cover noting any moisture or other foreign material which may be present on the cover or on the interior of the unit.

3. Inspect the Power Module potted print circuit board (PCB) for any visible damage or loose connectors.

4. Check load cell wiring TB1 through TB4 on the PCB for loose connections and correct wiring (see Figure 14.1) which should be:

Terminal	Function	Suggested Color Code
1	- Excitation	Black
2	- Sense (not used)	(***)
3	- Signal	Red
4	+ Signal	White
5	+ Sense(not used)	(***)
6	+ Excitation	Green
(**)	Shield	Yellow

(**) Shield should be terminated to one to the PCB mounting screws using a #10 ring terminal.
(***) In a few isolated cases, long term stability may be improved by jumping terminal pins ! & @ together and 5 & 6 together. This only needs to be done on <u>one</u> (1) terminal strip TB1-TB4.

5. Check the instrument wiring harness from the Power Module's water tight connector to terminal TB5 on the PCB (see Figure 14.1) for correct wiring.

Pin No. 10 Pin Connector	Terminal Location TB5	Function	Color Code
A	3	R X D (A)	Red
D	4	R X D (B)	White
E	6	+ 20V	Green
F	2	T X D (B)	Yellow
G	5	Ground	Blue
H	1	T X D (A)	Black

6. Check all other water tight cable connectors. Tighten any found to be loose.

7. Reinstall the DigiTOL® Power Module cover making sure that the cover gasket is clean and correctly located and sealant is applied to all gasket contact surfaces.

8. Lower scale platform back into the frame, reconnecting the instrument cable prior to completing the platform reinstallation.

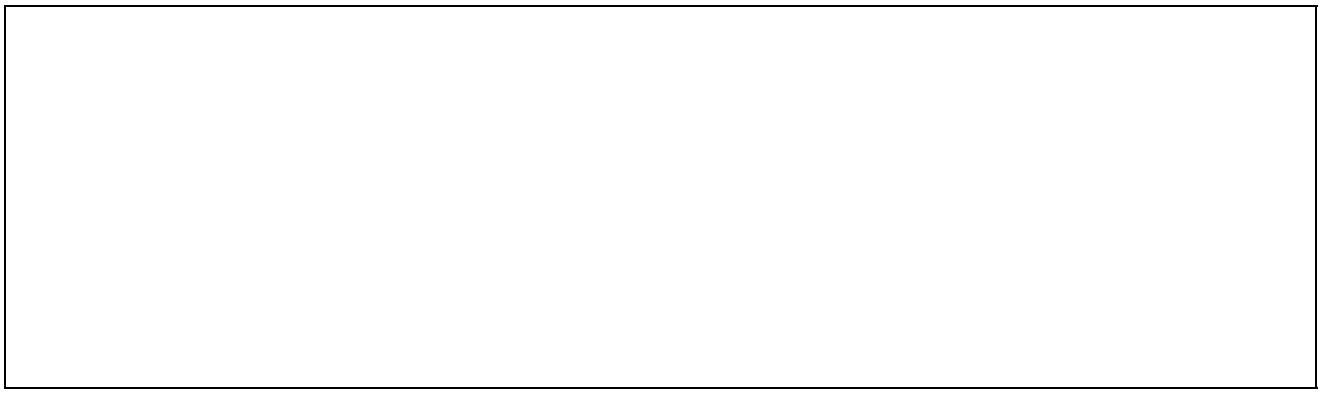
NOTE: Ensure load cell slider cups sear properly in check plates.

15.0 PROBLEM: SCALE OUT OF LEVEL, CORNERS NOT WEIGHING PROPERLY

All Mettler Toledo DigiTOL® instruments provide the capability to view each load cell's raw output when using the DigiTOL® Power Module. Viewing individual load cell outputs can isolate a defective load cell or can show uneven loading or out of level conditions which can effect shift/corner readings, repeatability, or overall weighing accuracy. Refer to the appropriate DigiTOL® Instrument Technical Manual for which setup parameter is used to view individual load cell outputs, The procedure is as follows.

1. ACCESSING INDIVIDUAL LOAD CELL OUTPUT
   Refer to the appropriate Mettler Toledo Instrument Technical Manual for instructions and information for the proper setup selection to allow the display of individual load cell outputs. These values are raw counts, unaffected by calibration or shift constants.

2. Access the output of load cell #1, with no load on the platform. Record the number indicated on the display. (See Figure 15.1 for load cell orientation).



(Top view of scale platform)

Figure 15.1 Load Cell Location in Understructure

3. Next view and record output values of Cells 2, 3, and 4 under no load condition.

4. Once all load cell output values have been viewed and recorded, compare each cell. Compare the highest output value to the lowest output value. The difference should not exceed the tolerance range given in Table 15-1.

5. If load cell output values are outside the acceptable count tolerance range (Table 15-1), it means the scale is out of level and may have difficulty in deriving accurate and consistent weights from corner to corner.

Acceptable Raw Count Difference (No Load)				
Scale Capacity	2k	5k	10k	20k
Raw Counts	2000	700	700	400

Table 15-1 Acceptable Raw Count

6. Add shims to corners which have a lower than acceptable output or remove shims from corners which have a higher than normal output, in order to level the scale platform and to evenly load each individual load cell. Recheck load cell outputs as described previously.

7. Perform shift adjustment.

8. Recalibrate scale platform.

16.0 PROBLEM: UNSTABLE ZERO, LINERAITY, AND/OR HYSTERESIS ERRORS, NON-REPEATABILITY, CREEP, OR UNSTABLE INDICATION UNDER LOAD

1. Check scale oscillation. Make sure platform is free to move in all directions. Platform should not rock across corners. If it does, shim corners to eliminate instability.

2. Check the bumper bolt clearance. Distance between bumper bolts and scale frame should be 1/16”. If this is not the case, remove the platform and add or delete washers as required until the clearance is correct. Bumper bolts are located on the side of the scale platform approximately 8” to 10” in from the corners (See Figure 16.1).

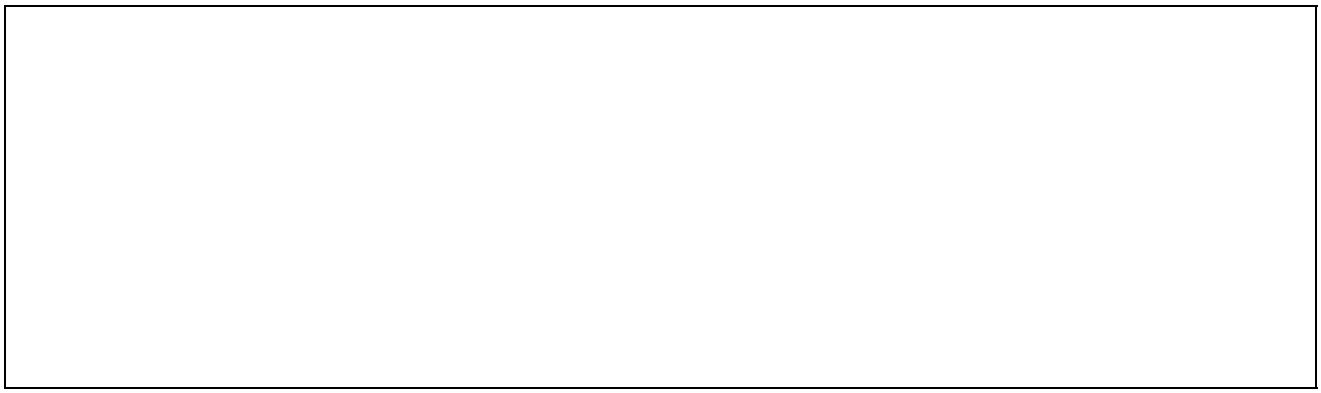
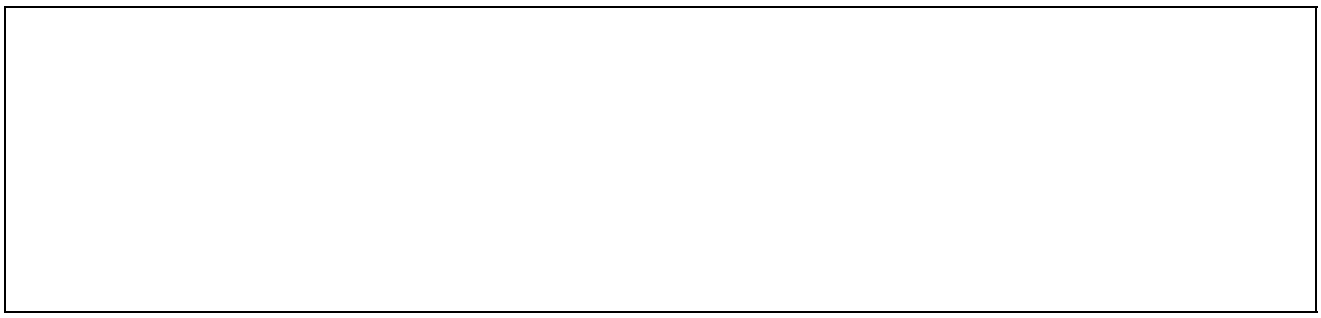
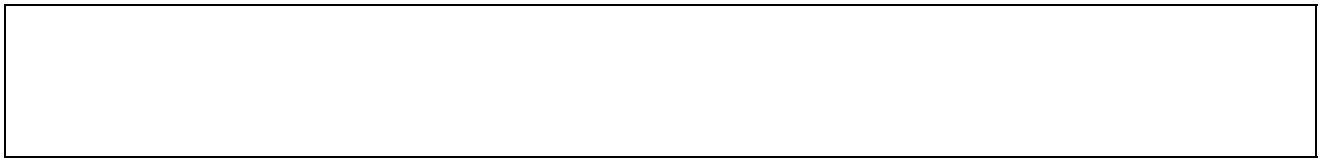


Figure 16.1 Bumper Bolt Details

a. If bumpers are adjusted while the platform is removed from the frame, inspect and remove any debris or other material which could contact the scale platform and inhibit movement.



Cable	Termination
Load Cell #1	TB1
Load Cell #2	TB2
Load Cell #3	TB3
Load Cell #4	TB4
8505 Instrument	J1
All Other Instruments	TB5



Terminal Position	Function	Color Code (Note C)
1	-Excitation	Black
2	-Sense (Not Used)	- - -
3	- Signal	Red
4	+ Signal	White
5	+ Sense (Not Used)	- - -
6	+ Excitation	Green
(**)	Shield	Yellow

(**) Terminate the shield wire to PCB mounting screw using #10 ring terminal.

Load Cell Resistance Check Points	
Measuring Points	**Resistance Value**
Any lead to Shield or Ground	Infinity
+Ex (Green) to - Ex (Black)	360 to 400 Ohms
+ Sig (White) to - Sig (Red)	348 to 352 Ohms

Figure 16.2 DigiTOL® Power Module J-Box Details (Connections)
(Top view with J-Box lid removed)

b. Inspect load cells and suspension assemblies for proper installation. Also make sure the load cells are secured tightly to the scale platform. Load cells should be torqued to 70 foot-lb for 1,000, 3,000, 5,000 lb load cells and 200 foot-lb for 10,000 lb load cells.

c. Reinstall the platform and check the scale for proper operation and proceed further for additional troubleshooting instructions.

3. If using a Mettler Toledo 8505 Weight Display, access setup Parameter 50 to view the raw output of individual load cells. If using one of the other Mettler Toledo DigiTOL® instruments, consult the instrument manual for correct setup parameter selection.

   a. View and record no load output values from all four load cells.

   b. Compare to ensure all four load cells are within acceptable tolerance from the highest to lowest output values at no load (Table 15-1). If not, level the scale as described in Section 15 of this manual. If an individual load cell output after leveling is still out of the acceptable tolerance range from the other three load cells, check the load cell's wiring and/or electrical characteristics to verify that the load cell is not defective (See Figure 16.2).

   c. Repeat this process again except this time after recording the no-load value, place a significant mass, at least 10% of the scale's rated capacity, over the load cell and record its value. Remove the weight and again record the no load raw output value.

   d. Compare to see that there has not been a change in zero. Display should return to the original load cell zero output value within ± 40 raw counts.

   e. Repeat this process for all four load cells. Compare the zero and loaded output values of all four load cells. The net difference should be approximately the same, within 200 raw counts.

   f. If one or more load cells are not within specification or of not react under loaded conditions, check the wiring and/or electrical characteristics of the load cell (see Figure 16.2).

   g. Replace any defective load cells following the steps listed in Section 18.0 of the technical manual.

4. If no response from the scale platform can be generated on the DigiTOL® instrument and the problem has been isolated to the scale platform, replace the DigiTOL® Power Module Printed Circuit Board. Reapply power once the new PCB has been installed. Observe to see if the problem has been corrected. To verify that the problem was in the DigiTOL® Power Module PCB, reinstall the original PCB and see if the problem returns.

5. Once problem has been isolated and corrected, perform shift adjustment.

6. Recalibrate scale platform.

17.0 LOAD CELL SPECIFICATIONS

1 Wiring Code

Function	**Wire Color**
+ Excitation	Green
- Excitation	Black
+ Signal	White
- Signal	Red
Shield	Yellow

2. Load Cell Resistance Check Points.

Measuring Points	**Resistance Value**
Any lead to shield or ground	Infinity
+Ex (Green) to - Ex (Black)	360 to 400 Ohms

+ Sig (White) to - Sig (Red) 348 to 352 Ohms

3. Other Data

Model Number: 743
NTEP Certificate of Conformance Number: 88-008
Maximum Excitation Voltage: 20VDC.
Recommended Excitation Voltage: 15VDC.
Full Scale Output: 2 mV/V.
Input Terminal Resistance: 380 ± 20 Ohms.
Output Terminal Resistance: 350 ± 2 Ohms.
Temperature Range Compensation: -10ºC to +40ºC +14ºF to +104ºF.
Safe Side Load: 100% of full load cell rating.
Safe Overload: 150% of full load cell rating.

18.0 LOAD CELL REPLACEMENT PROCEDURE

1. Remove power from the DigiTOL® instrument and disconnect the instrument to scale cable.

2. Power Module Access
   a. Mild steel scales - remove the access plate and Power Module (junction box) cover.
   b. Stainless steel scales - LIFTMATE scale platform out of frame to a sufficient height to access the underside of the scale. Properly support platform. Locate the DigiTOLº Power Module and remove its cover.

3. Disconnect the appropriate load cell cable(s) from the terminals on the Power Module Printed Circuit Board (PCB).

4. Loosen the water tight cable connectors on the DigiTOLº Power Module and remove the cable from the Power Module enclosure.

5. Carefully remove the platform from the frame assembly utilizing the lifting eyes provided with the scale. Position the platform onto a stable supporting surface that allows access to the defective load cell(s) and cable(s), while ensuring that the other load cells are protected from damage while the scale is disassembled.

6. Affix a string to the end of the defective load cell's cable at the Power Module. The string should be of sufficient strength and length to pit the new load cell's cable through the platform structure.

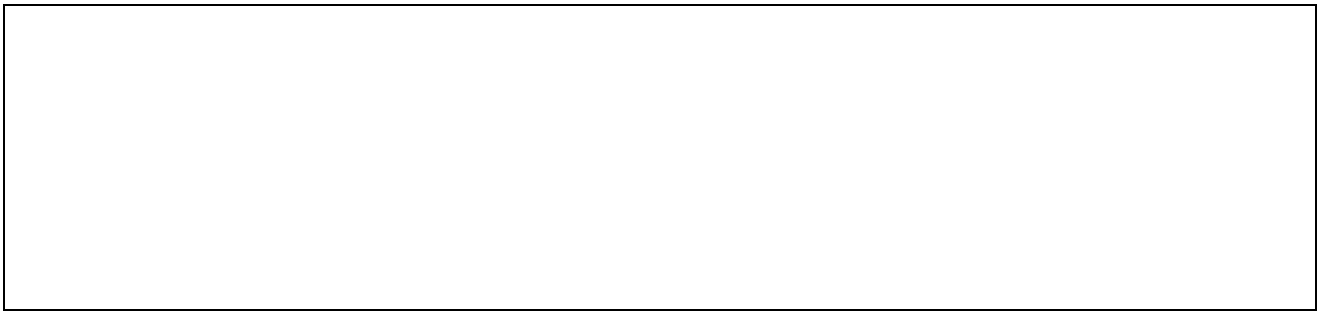


Figure 18.1 Load Cell Cable Assembly

7. Load cell assemblies are retained to the platform using two high strength hex head bolts. Using a socket wrench, loosen and remove the defective load cells, retaining the mounting bolts for reinstallation.

Load Cell Size	Socket Wrench Size
1,000; 3,000; 5,000lb	3/4"
10,000 lb	1 1/8"

8. Carefully pull the defective load cells cable through the platform feeding the string in at the Power Module location. Once the string is at both the load cell and Power Module locations, disconnect the string from the defective load cell cable.

9. Remove the suspension from the defective load cell and reinstall on the new load cell assembly (see Figure 18.1).

10. Attaching the new load cell's cable to the string from the load cell location, carefully thread and pull the cable through the scale platform to the power module, coil and place any excess cable in an appropriate storage area, (normally within the scale platform's channel).

11. Secure the new load cell cable into position with the two hex head bolts from the previous load cell. Lubricate the bolt threads with "Never Seez" or equivalent prior to reinstallation. Using a torque wrench, follow these tightening parameters.

Load Cell Size	**Torque Value**
1,000; 3,000; 5,000lb	70 ft.-lb.
10,000 lb	200 ft.-lb.

12. Thread the new load cell cable through the water tight cable connectors on the DigiTOL^{o} Power Module making sure that the connectors are tight (see Figure 18.2).

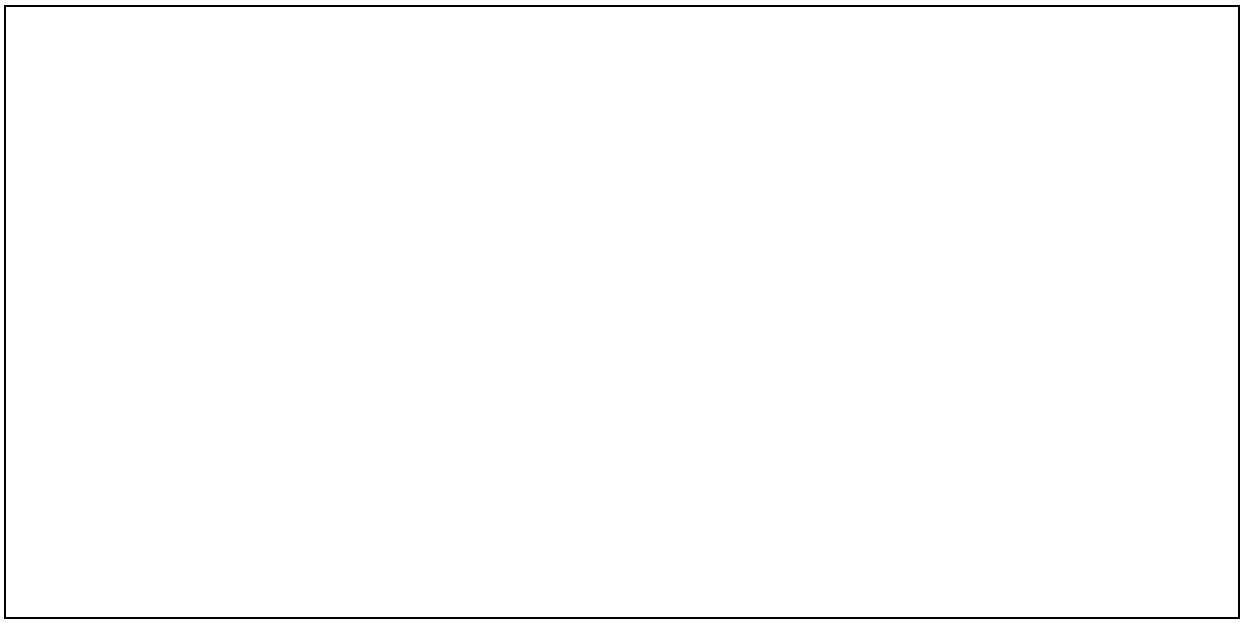


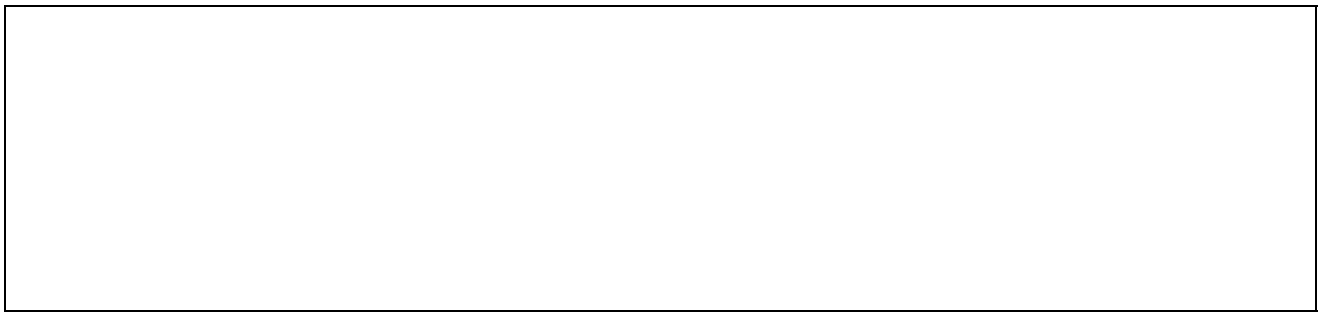
Figure 18.2 - Cord Connector Assembly

13. Wire the new load cell cable to its appropriate terminal block connector on the Power Module's PCB (see Figure 18.3).

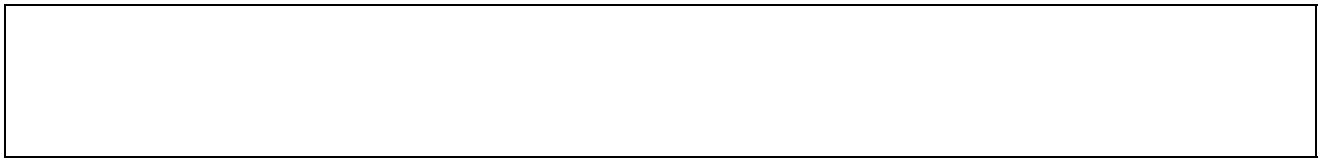
14. On stainless steel models, reinstall the power module cover making sure that the cover gasket is clean and correctly located and sealant is applied to all gasket contact surfaces.
15. Reinstall the weighing platform into the scale's frame threading instrument cable through the Power Module area, (and connected to the DigiTOL^{o} quick connector if stainless steel models), continue with platform installation following the guidelines set forth in Section 9.0 of the technical manual.

16. Install instrument cable Sections 10.0, 11.0 or 12.0 of this technical manual.

17. Perform shift adjustment and calibration to the scale system.



Cable	Termination
Load Cell #1	TB1
Load Cell #2	TB2
Load Cell #3	TB3
Load Cell #4	TB4
8505 Instrument	J1
All Other Instruments	TB5



Terminal Position	Function	Color Code (Note C)
1	-Excitation	Black
2	-Sense (Not Used)	- - -
3	- Signal	Red
4	+ Signal	White
5	+ Sense (Not Used)	- - -
6	+ Excitation	Green
(**)	Shield	Yellow

(**) Terminate the shield wire to PCB mounting screw using #10 ring terminal.

Load Cell Resistance Check Points	
Measuring Points	**Resistance Value**
Any lead to Shield or Ground	Infinity
+Ex (Green) to - Ex (Black)	360 to 400 Ohms
+ Sig (White) to - Sig (Red)	348 to 352 Ohms

Figure 18.3 DigiTOL® Power Module J-Box Details (Connections)
(Top view with J-Box lid removed)

19.0 SPARE PARTS LIST - 2157 FLOOR SCALES

Part Number	Description
13136900C	Load Cell - 1,000 lb
13079300C	Load Cell - 3,000 lb
13078900C	Load Cell - 5,000 lb
13078400C	Load Cell - 10,000 lb
MN21018	Rocker Pin - 1, 3, or 5K cell
MN21028	Rocker Pin - 10K cell
TN200088	Slider Cup - 1, 3, or 5K cell
MN21026	Slider Cup - 10K cell
MZ0909000005	"O" Ring - 1, 3, or 5K cell
MZ0909000012	"O" Ring - 10K cell
13421200A	DigiTOL® Power Module PCB (non-potted)
TA201161	DigiTOL® Power Module PCB (potted)
13640300A	Analog Junction Box PCB
TA800218	Desiccant Bag
MZ0905000003	3/4-10UNC Lifting Eye Bolt
TN201283-10	2-5K CS DECKMATE® Check Plate
TN201312-10	2-5K CS LIFTMATE™ Check Plate
TN201310-10	10K CS DECKMATE® Check Plate
TN201302-10	10K CS LIFTMATE™ Check Plate
TN201311-10	20K CS DECKMATE® Check Plate
TN201314-10	20K CS LIFTMATE™ Check Plate
TN201285	2-10K SS DECKMATE® Check Plate
TN201315	2-10K SS LIFTMATE™ Check Plate
TN201287	2-5K CS/2-10K SS 16 GA Slider Shim
TN201298	10K/20K CS 11 GA Slider Shim

20.0 APPENDIX A - 2157 ANALOG JUNCTION BOX (OPTIONAL)

20.1 GENERAL INFORMATION

An analog junction box is provided as an option for the 2157 line of floor scale base for user's which have existing analog style instrumentation or for areas which may be classified as hazardous by the National Electric Code (NEC) Article 500.

Unlike DigiTOL® floor scales, the analog option required manual shift/ corner adjustments (using Potentiometers) from within the junction box assembly. This also means that both mild and stainless steel models have access plated in the top of the platform to access the junction box during installation and normal maintenance.

20.2 STANDARD SIZES AND CAPACITIES

Model 2157 analog floor scales are available in all of the platform sizes and capacities found in Section 3.0 of this manual. Model numbers remain identical with exception of he sixth digit. Model numbering system includes:

	Mild Steel	Stainless Steel
DECKMATE®	215703XXX	215704XXX
LIFTMATE™	215713XXX	215714XXX

20.3 INSTRUMENT COMPATIBILITY

Model 2157 analog floor scale are compatible with me Model 8130, 8132, 8136, 8139, 8140, 8142, 8146, 8180, 8182, 8580, 8582 (with analog KOP), M5000, M8140, M8141, or M8147 digital instruments for all other digital instruments which provide A./D conversation within the instrument and are capable of interfacing to a full load cell floor scale system.

20.4 INSTRUMENT CABLE INSTALLATION

1. Follow installation instructions as applicable in Sections 5.0, 6.0, 7.0, 8.0, and 9.0 of this technical manual
2. Remove the junction box access plate from the scale platform.
3. Remove the junction box cover, loosen, and remove the water tight instrument cable connector.

4. Thread the instrument cable through the hole provided in the scale frame and platform, stopping at the junction box.
5. Thread the instrument cable through the water tight cable connector and into the junction box interior (see Figure 20.1).

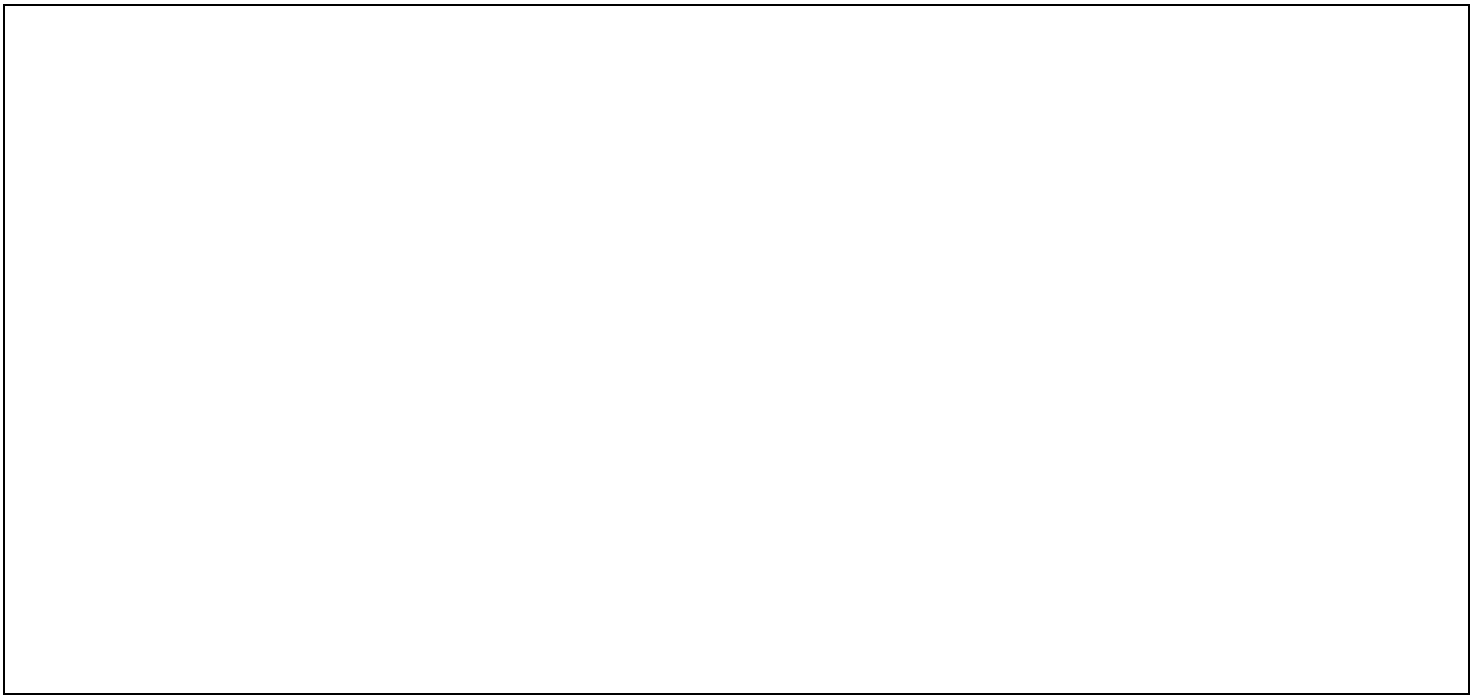


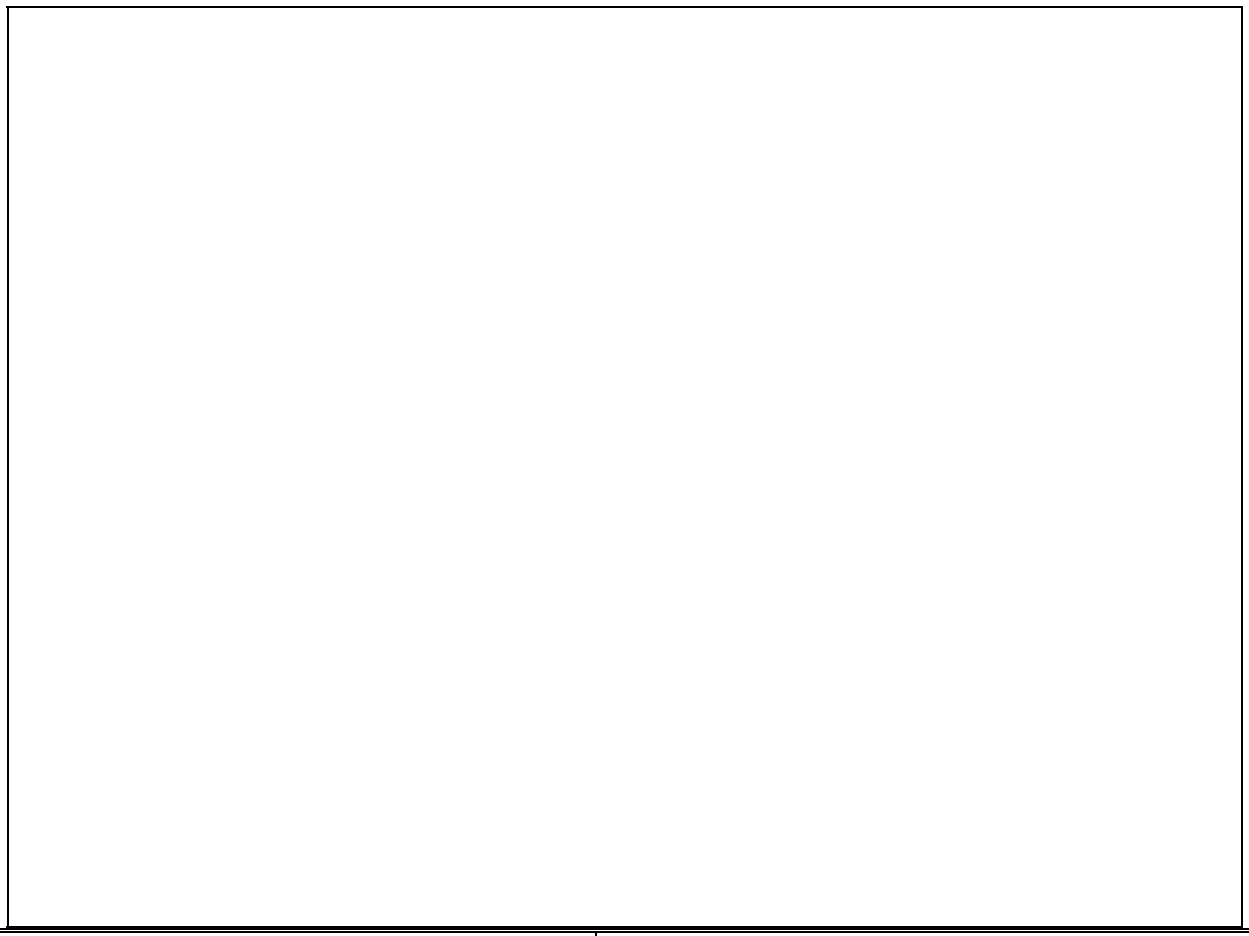
Figure 20.1 Cord Connector Assembly

6. Wire instrument cable to “Input” Terminal in the junction box assembly utilizing the following wiring code: (See Figure 20.2).

Color Function	Code (*)
+ Signal	Green
- Signal	Black
Shield	Orange
+Sense	Yellow
- Sense	Red
- Excitation	Blue
+ Excitation	White

(*) Using Mettler Toledo Scale Cable Number 510620370

7. Also check terminal strips TB2 and TB3 for tight correct wiring. Note no sense loads are present or connected from the load cells.



LOAD CELL WIRING		INSTRUMENT CABLE WIRING	
Function	**Color**	**Function**	**Color**
+ Excitation	Green	+ Excitation	White
+ Sense	Not Used	+ Sense	Yellow
+ Signal	White	+ Signal	Green
Shield	Yellow	Shield	Orange
- Signal	Red	- Signal	Black
- Sense	Not Used	- Sense	Red
- Excitation	Black	- Excitation	Blue
		(Based on Mettler Toledo Scale Cable Number 510620370)	

Figure 20.2 J-box Details and Wiring Codes

8. Load cell wiring color code for the 2157 shear beam load cell is:

Function	Color Code
+ Signal	White
- Signal	Red
+ Excitation	Green
- Excitation	Black
Shield	Yellow

9. Tighten instrument cable water tight connector on the junctions box. Check other connectors and tighten any found to be loose.

20.5 CALIBRATION

Changing indications, instability, or cause of any mechanical friction must be corrected before proceeding with scale calibration (see installation procedure above).

1. Shift Adjustment
   Shift adjustment is a precision electrical adjustment required to bring the output voltage (signal) on each load cell into agreement with the other cells in the system. This adjustment should be made only after all mechanical parts are checked, and the scale has proven repeatable. Repeatability is checked by repeatedly placing a test weight on the same position of the platform and checking for identical indications.

   Load cell trimming potentiometers are mounted on the junction box printed circuit board (see Figure 20.0)., the load cells are wired to the printed circuit board as shown in Figure 20.2.

   The amount of test weight used for the shift test should equal one-half (1/2) of the rated scale capacity. Test weights should be concentrated at the center of each quadrant of the platform.

NOTE: THE SCALE HAS BEEN ROUGHLY SHIFT ADJUSTED AT THE FACTORY. BEFORE PROCEEDING, CHECK THE SHIFT CHARACTERISTICS TO DETERMINE If ANY SHIFT TRIMMING IS REQUIRED. IN AN INITIAL INSTALLATION, ANY SHIFT ADJUSTMENT TO A PROPERLY SHIMMED SCALE SHOULD BE MINOR.

   a. Load Cell Trimming Procedure
   b. Successfully place the test weight at each of the four (4) designated locations (center of each scale quadrant). Note and record the displayed indications.
   c. Determine the location of the lowest indication. The corresponding load cell is NOT trimmed.
   e. Place the test weight at the location corresponding to the lowers indication. Note and record the indication.
   f. Proceeding clockwise, place the test weight at each designated location; if necessary, adjust the trimming potentiometer corresponding to that location to obtain the indication obtained above (Step 1.4).

   NOTE: Because of the trimming potentiometers' interaction with each other, any adjustment may affect all corner indications.

   g. Repeat Steps 50.5.1.e and 20.5.1.f until the indication at each designated locations is the same or within the specified National Institute of Standards and Technology (NIST) Handbook 44 Digital Scale Accuracy Requirements.

2. Cover Plates
   Place desiccant back in the junction box and reinstall junction box cover. Secure junction box access cover plate to platform.

3. Scale Calibration (Span)
   It is recommended to calibrate the scale using a test weight equal to the scale capacity.

   With the appropriate test weight, continue with the calibration of the weighing system according to the instructions described in the manual provided with your digital indicator.