7530

Installation
and
Assembly 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:

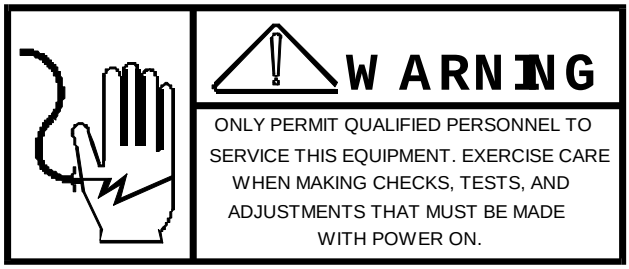
METTLER TOLEDO
Training Center
P.O. Box 1705
Columbus, Ohio 43216
(614) 438-4400

PRECAUTIONS

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

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

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



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

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

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

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

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

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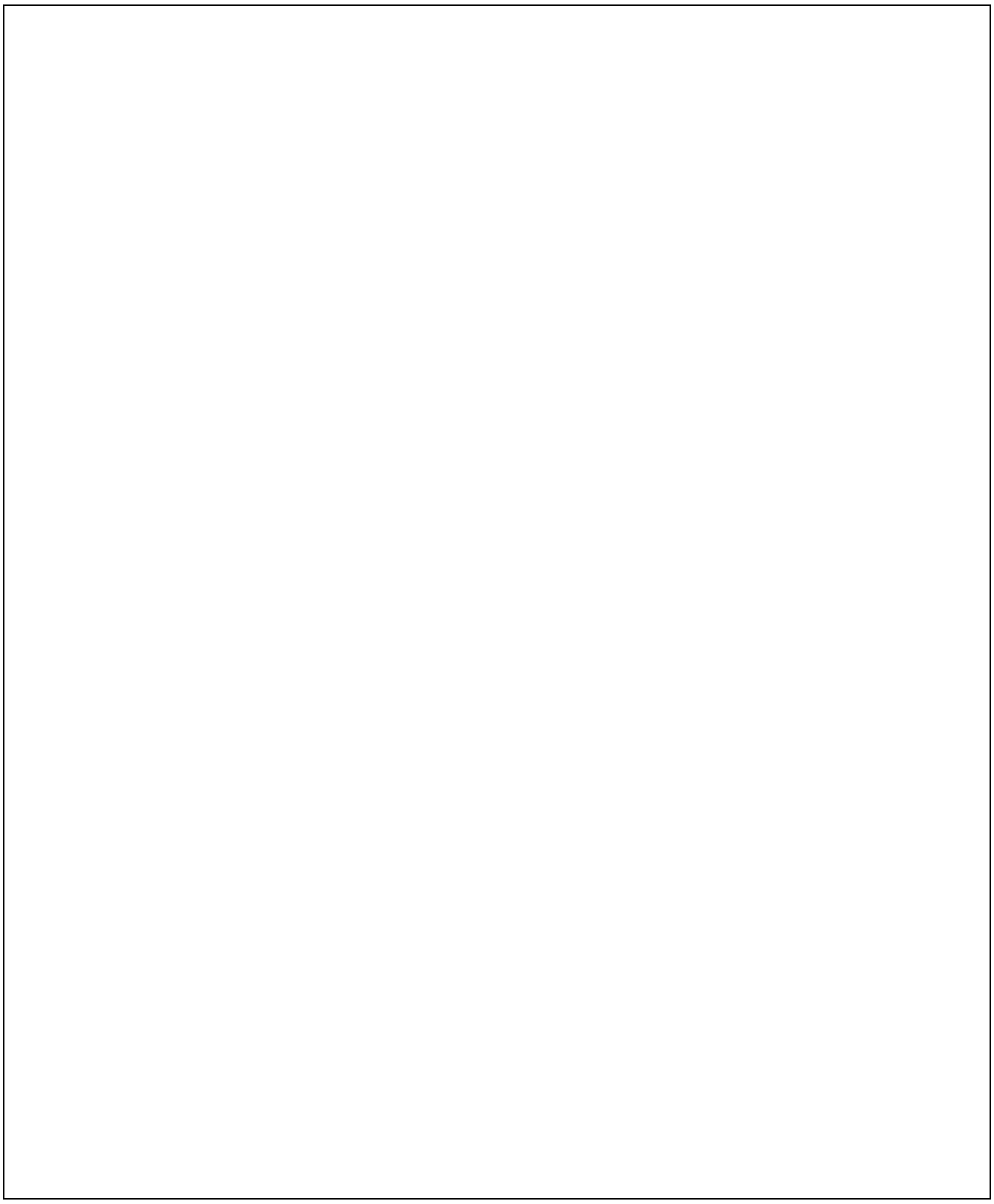
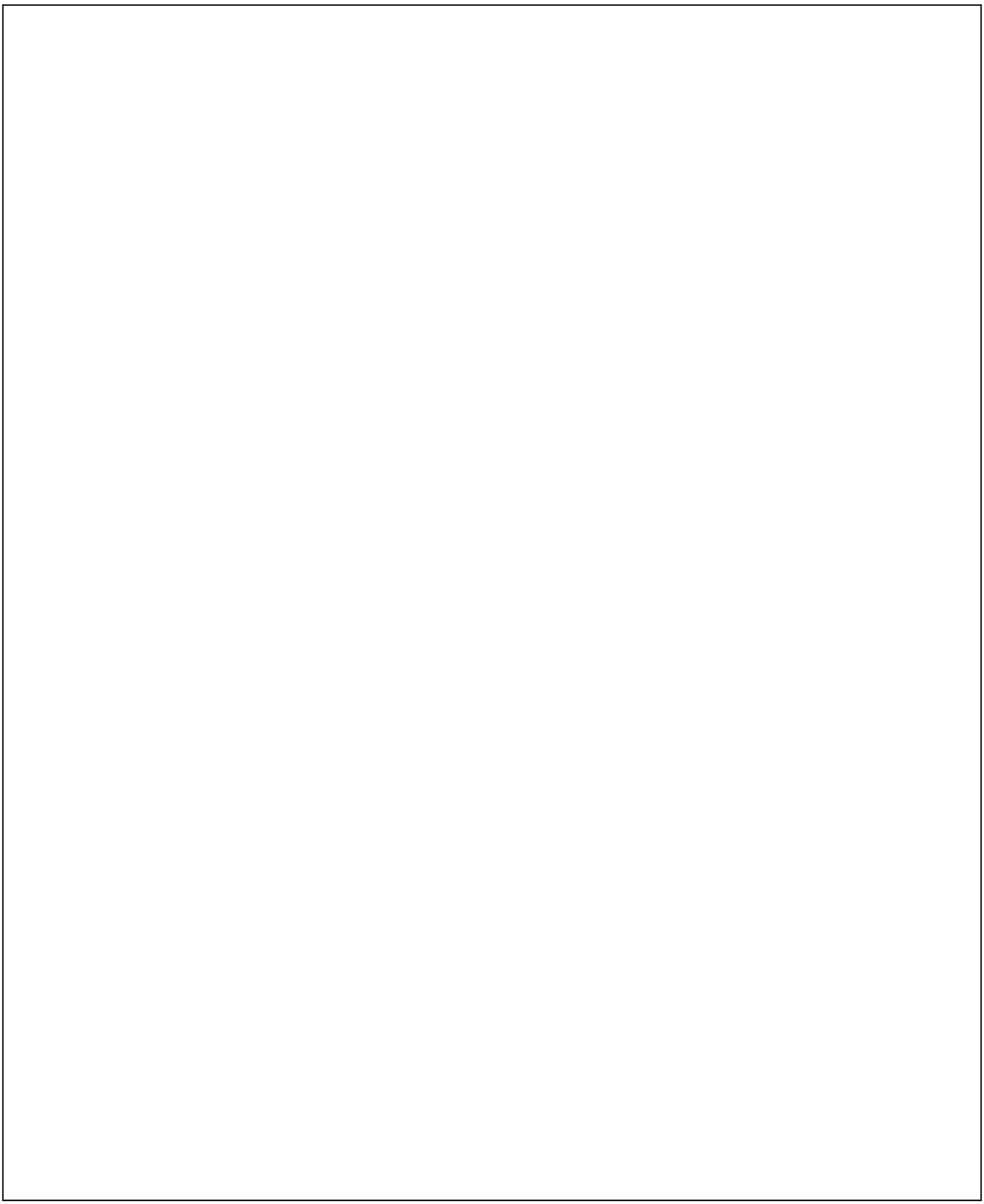




1.0 INTRODUCTION

The information provided in this manual is a guide in the installation of the Mettler Toledo Model 7520 Low Profile Truck Scale. The contencts of this manual are limited to installation considerations. Actual installation should be performed by qualified personnel only.

This document is intended only as a guide in the assembly of the 7520 Low Profile Truck Scale. The latest engineering drawings must be used as the definitive document for scale assembly.

All scales of goods described herein shall be subject to the standard warranty and the standard terms and conditions of sale published by Mettler Toledo. The specifications and product description contained herein are believed to be acceurate at the time of publication but are subject to change at any time without notice.

2.0 PRODUCT SPECIFICATION

MODEL 7520 STEEL DECK LOW PROFILE TRUCK SCALE

2.1 GENERAL DESCRIPTION

The Mettler Toledo Model 7520 Low Profile Electronic Truck Scale is a full load cell scale.

The Mettler Toledo Cap Check (TM) load cell system is utilized. This system consists of the Mettler Toledo shear cell with a rocker pin and a receiver which encircles the top of the cell. Horizontal forces resulting froim the braking action of the vehicles are transmitted through this receiver to the top of the load cell and into the foundation.

The platform consists of steel main girders and a bolt together deck. The deck consists of modular assemblues of deck plate and supporting beams. The structural steel conforms to ASTM A-36 specification and is welded in conformance with the structural welding code D1.1 of the American Weighing Society.

The foundation is of reinforced concrete of 3750 psi strength and is placed in accordance with American Concrete Institute Code. It is reinforced with deformed steel barrs conforming pto ASTM A615 grado 60 specification. Footings extending the width of the foundation, are tied together with a full length slab. Foundations with several different footing depths are provided to accomodate the variation in frost penetration depths across the country. The foundation is for use with soil ahving a minimumim bearing capacity of 2500 pounds per sqare foot. Two ten foot long approach slabs at each end of the paltform are an intergral part of the foundation.

The Mettler Toledo Model 8132 indicator is utilized to power the load cells and display the weight.

2.2 SPECIFICATIONS

TOTAL CAPACITY*	SECTIONAL CAPACITY**	PLATFORM SIZE	LOAD CELL	TANDEM AXLE CAPACITY
120,000 X 20 lb (60,000 x 10kg)	70,000 lb (32,000 kg)	60 ft x 10ft (18.3m x3m)	50,000 lb (22,700kg)	35,000 lb (16,000 kg)
120,000 X 20 lb (60,000 x 10kg)	70,000 lb (32,000 kg)	70 ft x 10ft (21.3m x3m)	50,000 lb (22,700kg)	35,000 lb (16,000 kg)
200,000 X 20 lb (100,000 x 10kg)	90,000 lb (41,000 kg)	60 ft x 10ft (18.3m x3m)	50,000 lb (22,700kg)	45,000 lb (20,000 kg)
200,000 X 20 lb (100,000 x 10kg)	90,000 lb (41,000 kg)	70 ft x 10ft (21.3m x3m)	100,000 lb (45,400 kg)	45,000 lb (20,000 kg)
200,000 X 20 lb (100,000 x 10kg)	110,000 lb (50,000 kg)	70 ft x 10ft (21.3m x3m)	100,000 lb (45,400 kg)	55,000 lb (25,000 kg)

* The total capacity is only obtainable with a two trailer vehicle.

** The Sectional Capacity is defined as follows: The maximum allowable live load that can be divided equally on the two load cells of a section,
resulting from a series of axles. The plane of the section is the vertical plane, perpendicular to the longitudinal axis of the scale and passing through the centers of the two load cells.

2.3 LOAD RATE

120,000 lb SCALES

The maximum allowable loads are: 20,000 lb (9,000 kg) per single axle, 35,000 lb (16,000 kg) per group of two or more axles spaced between 40 inches (1.02 m) and 96 inches (2.44m). The minimum distance between indise axles of adjacent tandems is 128 inches (3.25m). The maximum load for an “eighteen wheeler” is 80,000 lb (36,000 kg).**

200,000 lb SCALES
There are two load ratings got the 200,000 lb scales:

1. The maximum allowable loads are: 25,000 lb (11,000 kg) per single axle, 45,000 (20,000 kg) per group of two or more axles spaced between 40 inches (1.02 m) and 96 inches (2.44 m). The minimum distance between inside axles of adjacent tandems is 128 inches (3.25m). The maximum load for an “eighteen wheeler” is 100,000 lb (45,000 kg).
2. The maximum allowable loads are: 28,000 lb (13,000 kg) per single axle, 55,000 lb (25,000 kg) per tandem axle with axle spacing between 50 inches (1.27 m) and 110 inches (2.8 M) and more than 100 inches (2.8 m) between the axles of adjacent tandem. 17,000 lb (7,500 kg) per axle for groups of two or more axles with adjacent axles spaced between 42 inches (1.7m) and 110 inches (2.8m)..

2.4 ACCURACY

Scales meet NSB Handbook H-44 specifications for accuracy for truck scales.

2.5 ENVIRONMENTAL CONSIDERATIONS

The standard load cells are temperature compensated for a range of -10 to 40ºC (14 to 104ºF). Where required, load cells can be furnished with alternate compensation ranges.

The scale will perform to the stated accuracy under normal outdoor conditions provided that installation requirements are met. This includes adequate drainage and clearance of snow and debris from around and under the scale.

3.0 SITE SELECTION

1. The site selection must meet state and local requirements id the scale will be used for commercial ..weighing. The following is taken directly from Handbook 44 (H-44) issued by the National bureau of Standards:

UR.2.6 APPROACHES.
UR.2.6.1 TRUCK SCALES - On the approach end or ends of a vehicle scale installed in any one location for a period of six months or more, there shall be a straight approach as follows:

(a) the width at least the width of the platform, and
(b) The length at least one-half the length of the platform but not required to be more than 40 feet, and
(c) not less than 10 feet of any approach adjacent to the platform shall be constructed of concrete or similar durable material to insure that this portion remains smooth and level and in the same plane as the platform. However, grating of sufficient strength to withstand all loads equal to the sectional capacity of the scale may be installed in the portion.; and further, where deemed necessary for drainage purposes, the remaining portion of the approach may slope slightly.

The drawings provided meet part (c) of this requirement. The sire must be located to meet parts (a) and (b).

2. The sirt should have good drainage. Surrounding areas must not drain through the scale pit. The ideal scale site is on ground elevated above the surrounding area.

3. The soil must have a minimum bearing capacity of 2,500 pounds per square foot (psf).

4. Check for buried pipes, sewer lines, wires or foundations that would interfere with footing construction.
5. The scale should be located away from high power electrical transmission lines or substations.
6. Foundation footings must extend below the frost line.

7. The site should have adequate room at the sire for trucks to properly align with the platform before pulling on. This is especially important if trucks must turn before pulling onto the scale.

8. Trucks should remain on the scale for a period of time no longer than is necessary for obtaining the vehicle weight.

9. Some officials require that the scale platform be clearly visible from the location of the scale instrument. Others allow the use of closed circuit TC or even a voice intercom. Obtain their approval before starting construction.

10. Provide clearance of at least 3 feet on both sides of the scale for the full lenght of the platform to allow for assembling the frame and to allow access to the load cells for assembly.

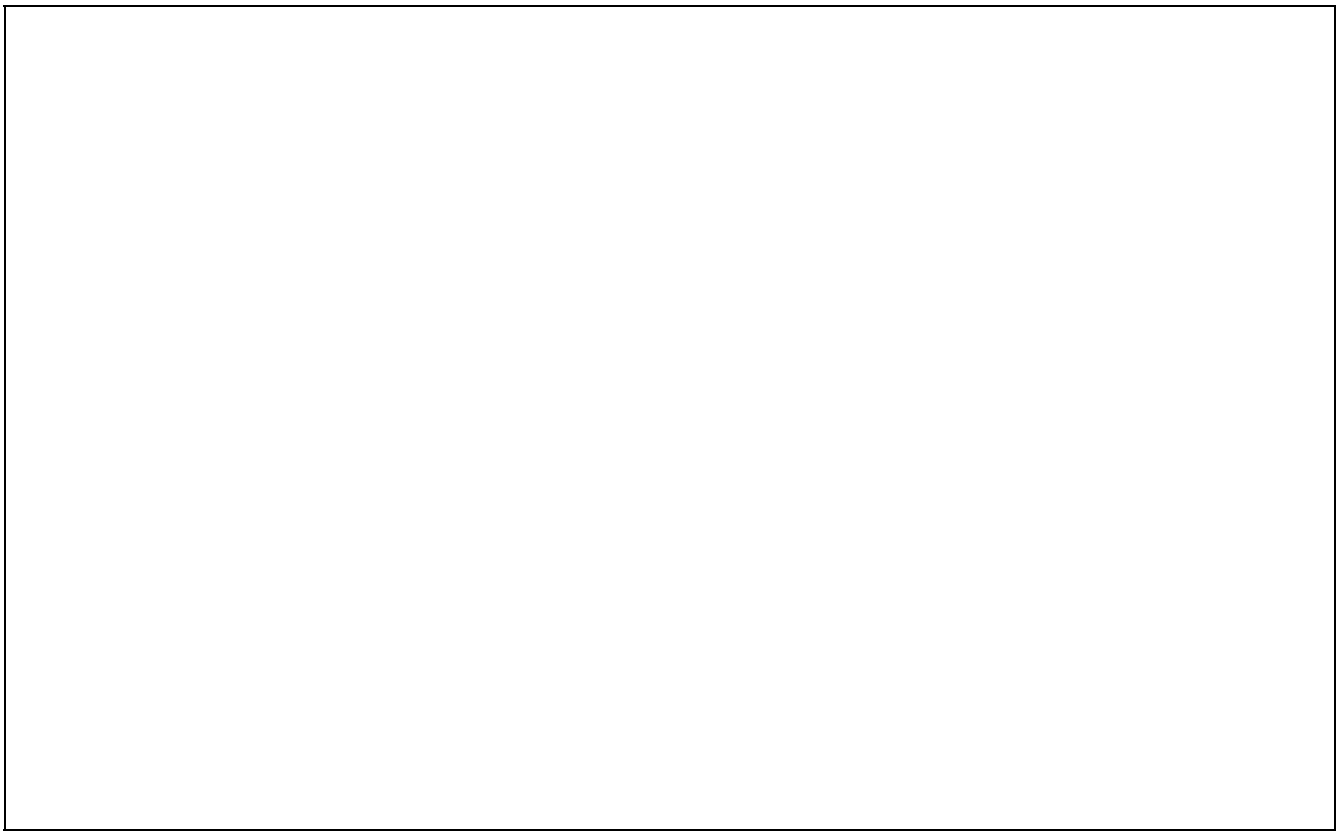


FIGURE 3.1 - SITE PLANNING

4.0 PIT CONSTRUCTION

The following sequence of construction should be followed:

1 Obtain all drawings and make certain they are the latest released by Toledo Scale Engineering. The latest drawings will be sent upon receipt of the scale order and also with the laod cells and scale electronics. Standard drawings are available for 12", 24", 36" or 48" footings.

2 Grade the site, including approaches.

3. Excavate for footings and foundation. In case of especially good drainage the perimeter trnch is not necessary. Do not attempt to eliminate the trench without consulting a qualified soil engineer.

4 Place gravel underfill (Optional).

5 Place the reinforcing bars for foundation. Insure they are placed exactly as shown on the drawings. For electrical grounding purposes, tie the reinforcing bars together with a minimum #16 wire ties at no less than 25% of the intersection points of the rebars. The importance of grounding is discussed in Section 7 of this manual. Read this section prior to installation.

6 Set anchor bolts using load cell mounting plates to indsure the bolts are in correct location. Assemble the clamping plates to the anchor bolts and clamo them to the reinforcing bars. Electrical connection between anchor bolts and reinforcing bars (for grounding puyrposes) is accomplished via these clamping plates.

7 Level the base plates. Although these plates will be later removed to facilitate jacking of the weighbridge, the leveing nuts will remain in place ensuring the correct positioning of the plates when reinstalled (See Figure 6.1).

8 Form and pour foundation including approaches and guides using concrete of the strength specified on the drawings. If the foundation is subject to frost, air entrained concrete should be used.

9 The foundation should be allowed to cure for one week before proceeding with construuction. The concrete must be allowed to fully cure (up to four weeks) and must not be loaded until it has reached the specified strength.

10 At this time, the load cell mounting plates must be removed from the anchor bolts. This allows room for the hydraulic jacks in lifting the weighbridge during installlation of the load cells.

5.0 WEIGHBRIDGE ASSEMBLY

5.1 SAFETY PRECAUTIONS - CAUTION

When using jacks on the weighbridge, as with any heavy structure, always place shoring or hard wood blocks for support under the steel before reaching under or working on the weighbridge (see Figure 5.1).

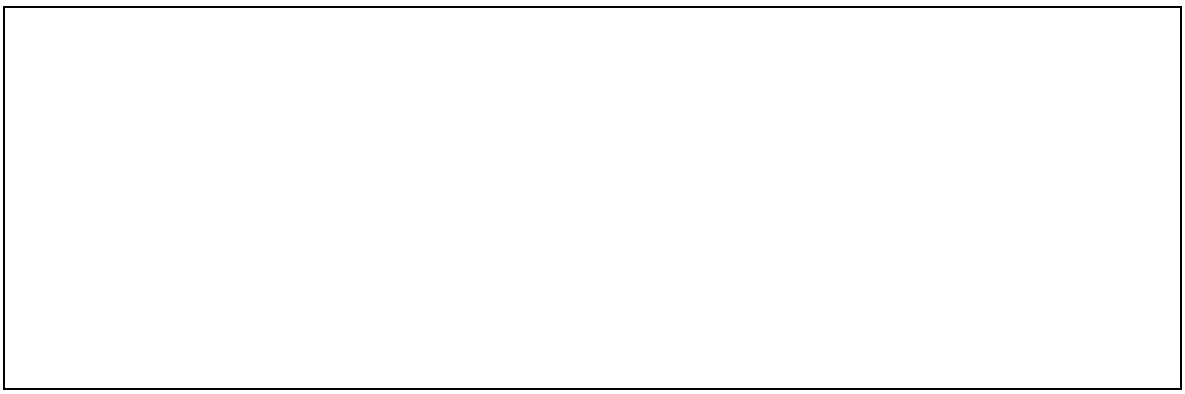


Figure 5.1 - Blocking Instructions

Never use cinder or concrete blocks.

When blocking the weighbridge, do not use a high single stack of blocks, but arrange the blocks to form cribbing as shown below. (See Figure 5.2).

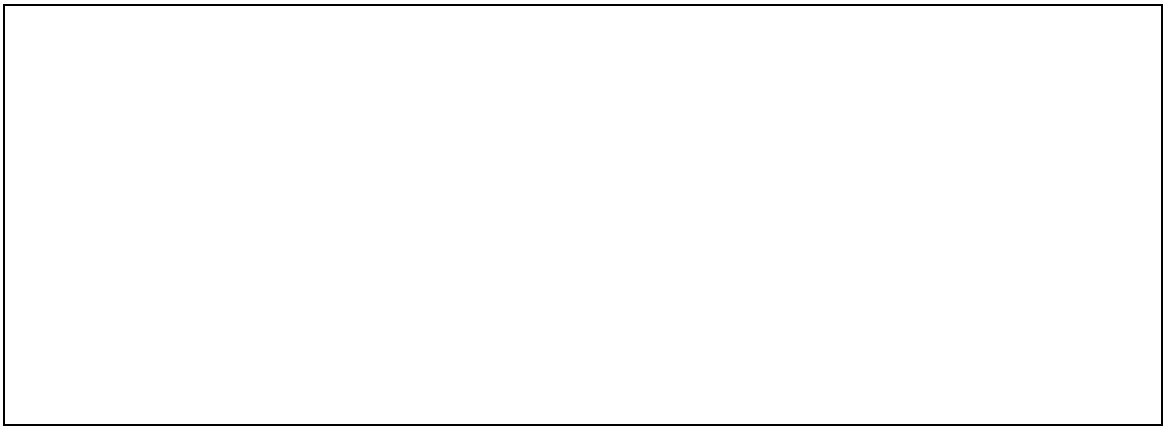


Figure 5.2 - Cribbing Instructions

The weighbridge consists of twwo main girders connected by crossmembers. Each main girder is furnished in three peices and is connected with two hinge joints per side as shown in Figure 5.3. Each crossmember joins the main girder through four bolts at each end.

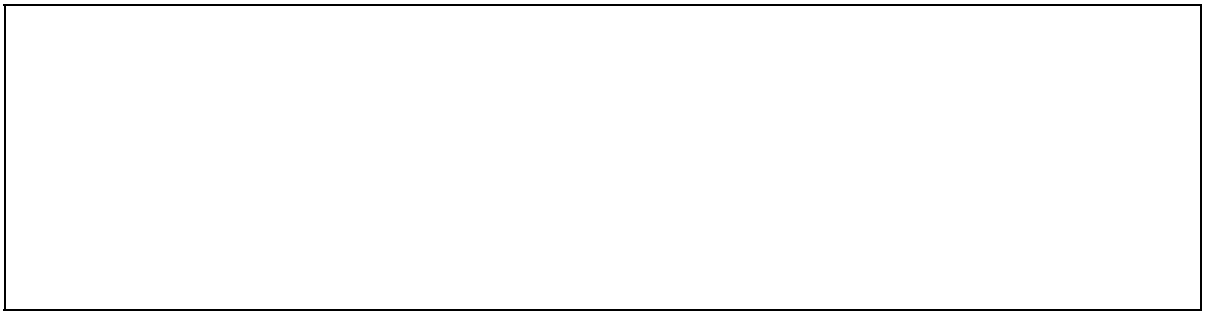


Figure 5.3 - Relative Location of Major Parts

5.2 TOOLS REQUIRED FOR WEIGHBRIDGE ASSEMBLY

5.2.1 LIFTING MECHANISM

A method of lifting and moving a 2000 pound girder is required. A heavy duty test truck with boom or a fork lift truck may be utilized.

5.2.2 HYDRAULIC JACKS

Four (4) 10-ton jacks are required. If eight (8) are availabale, the installation will be easier. The kacks must be no taller than 9-1/2 inches at their lowest height. One tow jack will be required to lower the comleted weighbridge onto the load cells. This jack should have a minimum height of about 3 inches, and a capacity of 10 tons. It is recommended that this jack be located prior to installation. Usually tow jacks can be rented from a local took rental company.

5.2.3 IMPACT WRENCH

A 3/4 or 1 inch size impact wrench will save installation time since there are approximately 100 bolts, depending on the length of the platform, which must be tightened to 360 foot pounds each. If an impact wrench is not available, a large socket handle (or steel pipe) about 4 to 5 feet long will be needed to develop the torque necessary to shear the heads of these special bolts. These bolts are used to connect the cross-members to the main girders.

5.2.4 SPECIAL “TORX” SQUARE DRIVE SOCKET

This socket is provided with the scale steel is used to tighten the special “Torx” bolts that fasten the crossmembers to the main girders.

5.2.5 A wrench to fit 1-7/16” nuts is required to hold the nuts on the “Torx” bolts.

5.2.6 Sockets needed for tightening the load cell assemblies as shown in Appendix C.

5.2.7 A short Allen socket (of 2” overall height and the required size) is needed to tighten the hexagon head screw used to secure the load cells to the mounting plates.

5.2.8 Wood Spacers about 6” x 12” and 1” thick. Thirteen will be needed for the 60 foot platform and 15 for the 70 foot scale

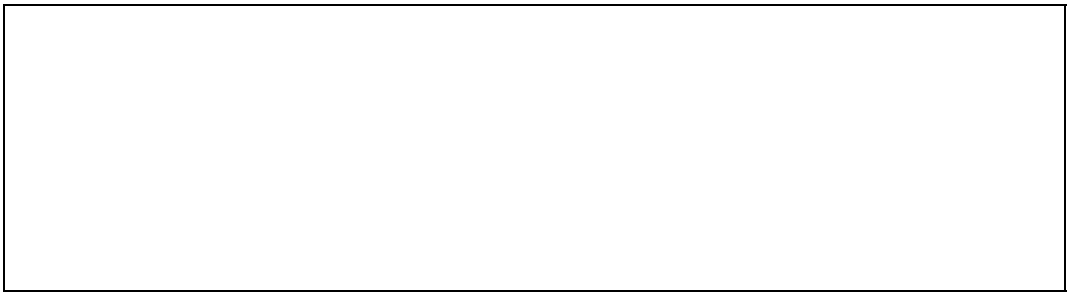
5.2.9 Spud wrench or tapered punch to line up bolt holes when assembling girders.

5.3 BREAK-AWAY BOLTS

The bolted crossmember connections use break-away head retaining bolts. This bolt head will shear when the proper torque is reached.

The “Auditorx” High Strength Pan Head Bolt (7/8 - 9-3’) long is tightened using the 3/4” square drive “Torx” socket provided. BE SURE to carefully follow the assembly instruction drawings for bolt, washer, and nut orientations for each connection.

Figure 5.3 - “Torx” Bolt, Washer, and Nut Assembly



LEAVE ALL BOLTS LOOSE UNTIL WEIGHBRIDGE STEEL MEMBERS ARE COMPLETELY ASSEMBLED, then apply snug tight and final torque values. Do not open any holes and do not taper bolts to facilitate installation.

NOTE: Strength development of the bolted connections required that the bolts, buts and washers conform to ASTM A-490 specifications, and that the bolt lengths be such that threads are excluded from the shear plane. The mating surfaces of the shear plane must be free of dirt or oil.

The “Auditorx” high strength bolts are coated with a lubricant. No additional lubricant shall be used.

5.4 WEIGHBRIDGE ASSEMBLY

5.4.1 Remove load cell mounting plates from their anchor bolts to provide clearance for jacks. Do not disturb leveling nuts. The jacks will be used to raise the completed weightbridge. Mark the mounting plates so they may be returned to the same location. Make sure the foundation is free of all debris.

5.4.2 Position the three peices of one main girder in place on the foundation per Figure 5.4 (A)

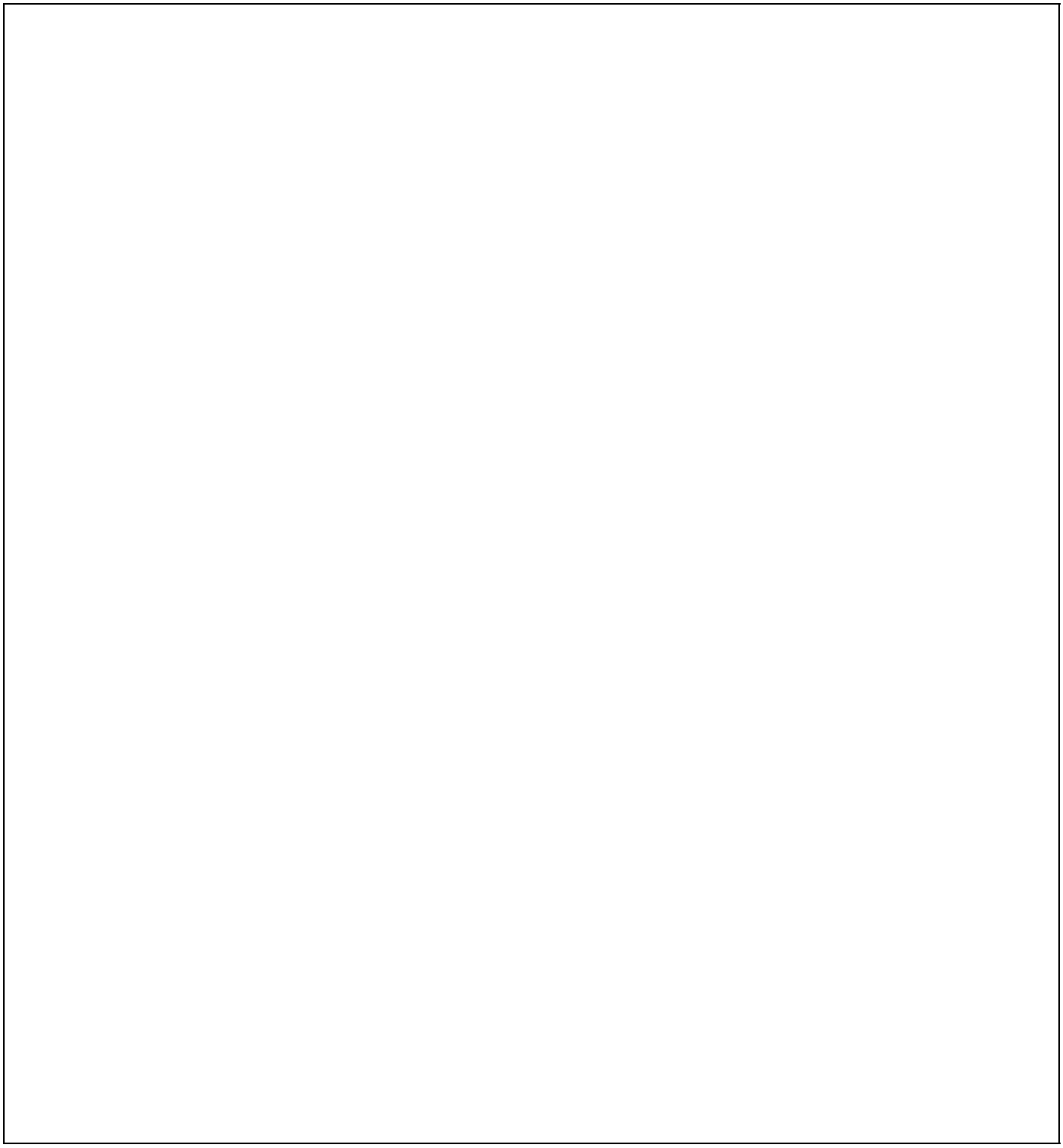


Figure 5.5 - Sequence of Weighbridge Assembly

5.4.6 After all three pieces are assembled and the crossbeam bolts tightened to specification, assemble the hinges, with the hinge pinds and two retaining rings in place per Figure 5.6 and 5.7. Then, as a final step, tighten the bolts in the hinges.

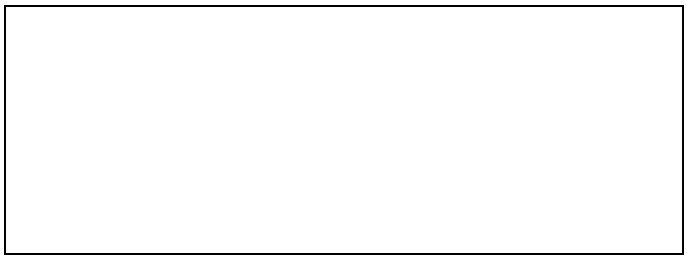


Figure 5.6 Hinge Assembly (Top View)

5.3.7 The weighbridge steel will be the form for the concrete. It must be places flat on the foundation. Use wood strips under the end crossbeamss to prevcnt leakage of the concrete while the deck is being poured.

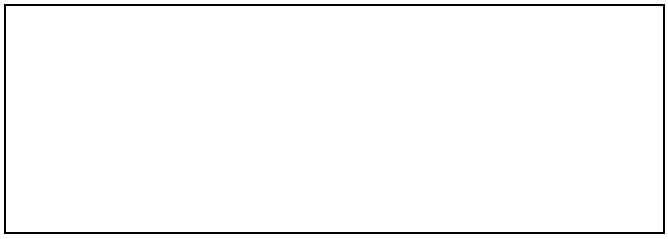


Figure 5.7 - Hinge Assembly (Side View)

5.3.8 Install re-bar steel in accordance with general layout prints. The transverse bars should be placed in the bottom layer as shown in Figure 5.6. Ensure that all bars are tied together and that ends of the bent bars are directed UPWARDS. There must ne a one inch clearance (+/- 1/8 inch) between the bottom of the bridge to the bottom of the bars in the bottom (transverse) layer. Short pieces of 37 re-bar can be used for spacers to hold the bars up for pouring the concrete.

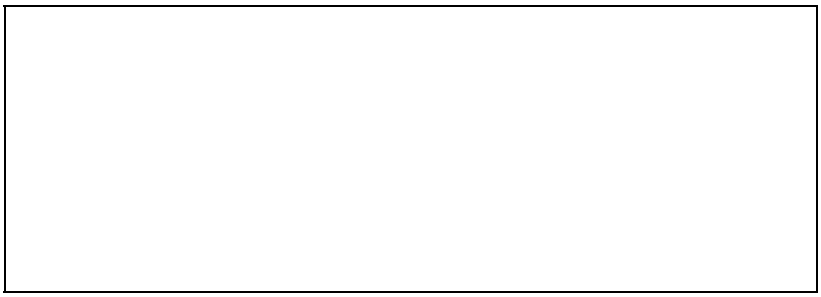


Figure 5.8 - Re-Bar Details

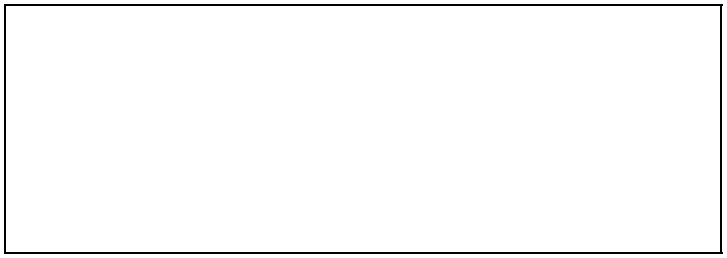
5.3.9 Pour the deck per the general layout drawings using concrete specified. The weighbridge may be jacker up after two weeks. However, do not apply any load during the full (28 day) curing perios or until the concrete meets specified strength. If the area is subject to frost, an air entrained concrete should be used.

5.5 HINGE PLATE SPACERS

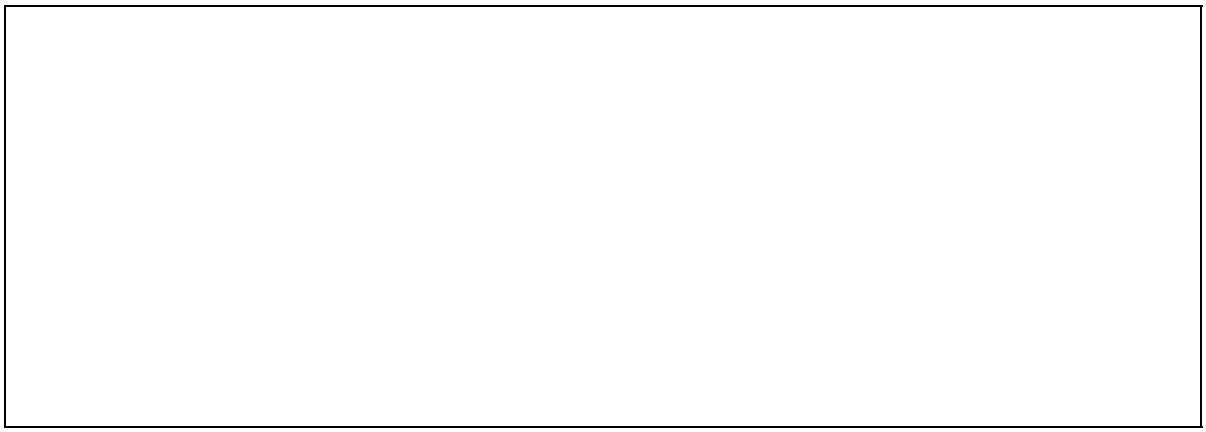
Hinge Plate Spacers are provied for installation on the 7520/7530. To work properly, these spacers MUST be installed. Changes and shift problems are caused when these spacers are not used.

If you see changes or shift problems, check the hinge plates to verify that the spacers are installed. The hinge Plates MUST NOT grip or apply pressure to the Girder which is supported by the Hinge Pin.

The Spacer is 20 guage stock metal which may be fabricated locally if needed.



Hinge Assembly (Top View)



Hinge Assembly (Side View)

6.0 LOAD CELL INSTALLATION

1. Jack up the weighbridge, Figure 6.1 shows jack location with load cell removed. If four jacks are used, ones side of the weighbridge should be raised then supported on shoring four inches high. The other side then be raised and supported on shoring 4 inches high. The jacks must be removed to make room for the load cells.

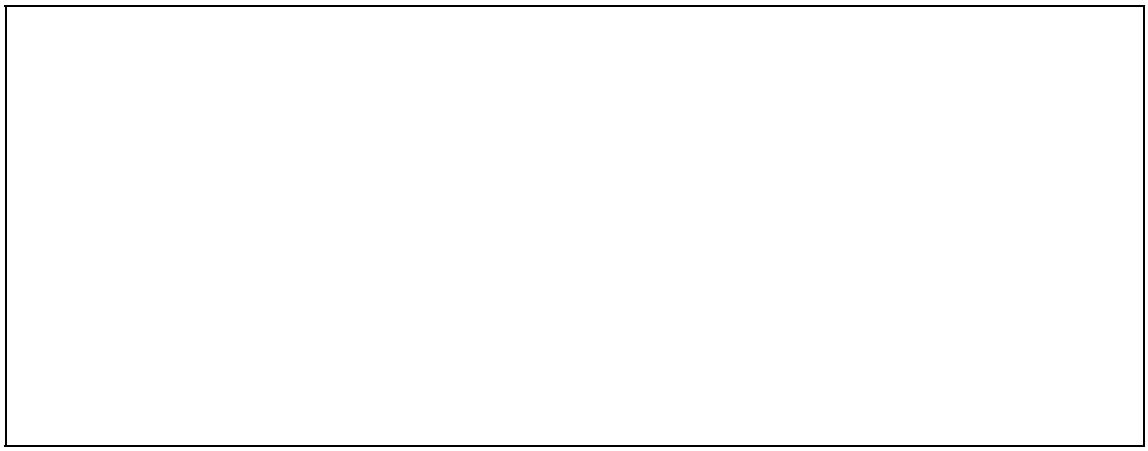


Figure 6.1 Jack Location

2. At this time the load cell mounting plates must be re-installed. The plates must be level within 0.03 inches in 12 inches and in the same plane to within 1/8 inch. Check the height with a transit. Do not apply any load to the scale before the grout is installed and has cured.

3. Check all load cells to make sure that all the load cells are centered. The load cell assemblies are held together with temporary shipping straps fastened with 8 bolts on each assembly. The top ends of the straps also hold the cap check mechanism which is centered on the top of the cell.Sometimes the caps may not be perfectly centered. The clearance should be 5/32 inches on all sides (see details in Figure 6.2). The shank end of a 5/32 twist drill is a convenient gauge for this measurement (0.156 inches diameter), It may be necessary to loosen the top bolts to center the cap. Tighten the bolts once the cap is set correctly. A 3/8 drive 7/16 inch socket, a short extension and ratchet handle is very this work.

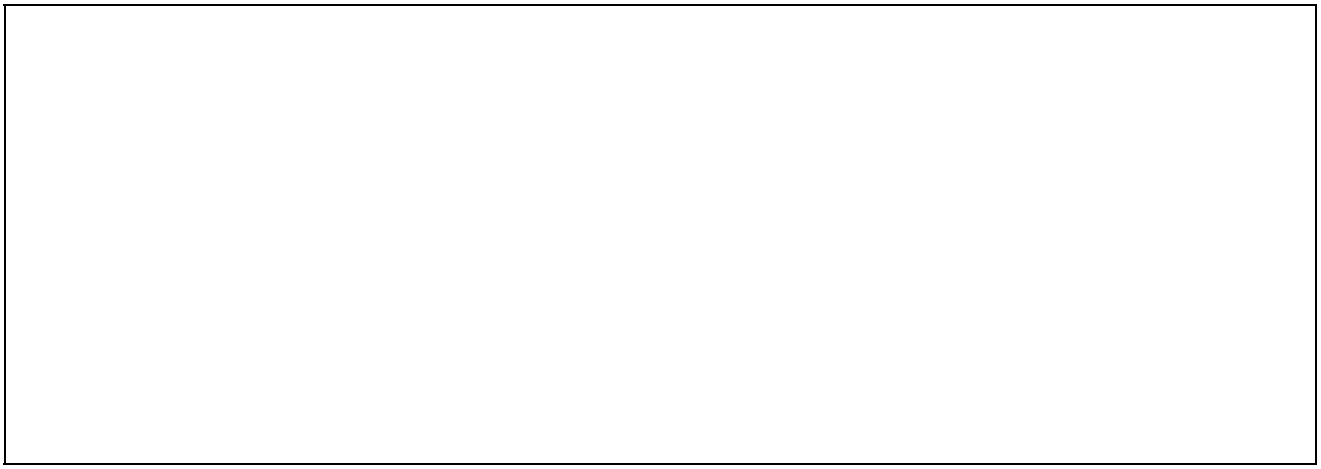


Figure 6.2 - Cap Check Load Cell

4. Set the load cell assembled on top of the load cell mounting plates. Secure them with hexagon socket head screws. Tighten to the required torque by using the "turn-of-nut" method described in Appendix C. It will be necessary to use a special short socket to tighten the bolts in the corners.

5. Lower the weighbridge on to the load cells. It will be necessary to use a step or toe jack for this purpose. The jack is placed under the main girder next to the load cell. Take the load off the shoring, remove, then lower the weighbridge on to the load cell assembly. Be certain all bolt holes are in line.

6. Place the bolts in the clamping bar and attach to the top plate. When they are all in plage, torque to specifications on torque chart (Page 15).

7. Remove the shiipping straps from the load cell assemblies. Jeep the strap for convienent handling of the cells. They may be stored in the space above the load cells. Check cap must have uniform clearance around the load cell. UNDER NO CIRCUMSTANCE MAY THE COP CHECK TOUCH THE LOAD CELL UNDER STATIC CONDITIONS. (Static load, no movement). See figure 6.2 for details.

8. Check alignment between deck and approaches.

9. Grout load cell mounting plates and allow to cure before applying any load to weighbridge. MAKE SURE GROUT FULLY SUPPORTS PLATES, FILLING ALL VOIDS. Use EXPANDING TYPE grout as specified on drawings. EMBECO 636, POR-ROK RPOXY GROUT, or equivalent, to develop 3750 psi compressive strength.

   Follow the grout manufacturer's indtructions carefully. Some basic rules apply to all types:
   a. The area must be clean and free from loose materials, oil and dirt.
   b. Saok the concrete with clean water for a period of several hours prior to pouring the grout.
   c. Ensure grout fully supports plate.
   d. Bulding forms for the grout, use grout in a flowable consistency and pour into form. It is important that grout reaches design strength before any load is applied to scale.
   e. Mix grout completely and do not add more water than is required as this will cause shrinkage.

7.0 WIRING AND GROUNDING

7.1 WIRING

It is absolutely essential that all load cell cables be installed correctly. It is equally important that all electrical parts be kept absolutely dry on the inside and as dry as possible on the outside. The load cells, connectors, and the junction boxes are watertight; however, continuous exposure to moisture may cause corrosion which would eventually break down the seal and ultimately allow moisture to reach sensitive parts. Any moisture can cause drifting or zero change and degrade the accuracy of the scale. Some things that can be done to insure easy installation and satisfactory operation are:

7.1.1 Assemble the cord grips at the load cell prior to running the cable through the conduit. The threaded end should be away from the connector. This is shown in Figure 7.1.

7.1.2 Make sure that all connections into the junction box have pipe joint compound on them and that they are tight. Unscrew any plugs that were not previously removed. Coat with pipe joint compound and replace. Again make sure they are tight.

7.1.3 Tighten, but do not overtighten the cover bolts. Overtightening can warp the cover forcing the gasket out of place. After final checkout, a silicone sealant (provided) will ensure the integrity of this joint. If applied at this time the sealant my become contaminated.

7.1.4 Sealant should be applied between the load cell cable and the conduit connector on the inside of the junction box. An RTV Silicone sealant applied with a caulking gun should be used. Any air that can get into the box will contain moisture that can condense on the inside of the box.

7.1.5 Connect the braided ground wire to the outside of the junction box on one of the mounting feet, as shown in Figure 7.2,7.3 and 7.4. Do not run the braided ground wire inside the junction box. It cannot be sealed completely since air and moisture can pass between the wire braids.

7.1.6 Conduit to indicator. One inch rigid metal conduit must be used for the cable connecting the instrument to the junction box. Each cable must be in its own conduit. Do not attempt to run more than one cable in any conduit. One instrument will interfere with another if they are connected to multiple load cell cables in a common conduit.

7.1.7 Mount the junction box so that the load cell cables enter the sides of the box. The box should have the surface with no holes in it at the top to reduce the possibility of water entry.

7.1.8 When load cells do not have cables integrally attached, be careful when conncting the cables to the load cells. The connectors can be damages if cross threaded. The connector must be correctly and completely seated so that the gasket will deal out all moisture. This cannot be done if the threads are crossed. Do not use wrenches or pliers on this fitting. If the fit is correct and free of foreign material, it can be assembled by hand**. AGAIN**, do NOT USE tools to tighten.

7.1.9 Rigis conduit must bot be used for weighbridge to foundations connections. Use the flexible conduit provided for this purpose.

7.2 GROUNDING

Grounding of the 7530 Low Profile Truck Scale is important for several reasons. Most importantly is safety. Electrical devices of this type must be grounded to protect the operator and others that come in contact with it. Grounding details are shown in Figures 7.4.

Grounding will help the scale operate more accurately. A good ground system used in conjunction with a surge protection will minimize the probability of damage due to transient surge voltages.

Methods for obtaining a good ground.

7.2.1 The best ground connection available is the concrete reinforcing bars in the scale foundation. The bars form a grid consisting of longitudinal and transverse bars tied together with #16 (min.) wire ties extending the full length and width of foundation. This grid is connected to the load cell mounting plates through the anchor bolts. The bars have a large surface area, and the concrete below the surface of the earth has a high concentration of moisture. These factors contribute to a very effective low resistance ground connection. All anchor bolts are connected to the foundation reinforcing bars. This grid in concrete provides the maximum surface area available for dissipation and is superior to techniques using only ground rods.

7.2.2 All component parts of the scale are connected together with wires, metal conduit, or metal frame to form a continuous metallic low resistance path which shunts unwanted, stray electrical currents. This is more effective than several ground rods that may exhibit a high resistance to ground and can introduce unwanted electrical currents into the sensitive electronics of the scale system causing inaccuracies or permanent damage. Details of transient surge voltage protection can be found in Toledo's Surge Voltage Protection Guide.

7.2.3 Rigid metal conduit buried in a trench along side a #6 copper ground wire is the ideal conduit for load cell cable. The metal conduit protects the load cell cable from unwanted electrical interference, keeps the cable dry and the #6 copper ground wire provides a good ground connection between the instrument, the junction box and the load cells. Plastic pipe must never be used for load cell cables.

8.0 CALIBRATION PROCEDURE

1. Drive the test truck across the scale three (3) times in both directions. This should seat all mechanical parts.

2. Calibrate the scale. Set zero and span to within a few graduations. Do not spend time making an exact span setting at this stage.

3. Check for repeatability and zero return. This may be accomplished by bringing the truck to precisely the same position near the center of the platform three (3) times, recording the truck weight and the return to zero value each time (it is recommended that the auto zero maintenance be disabled at this time.) These readings must be within one graduation of each other. If they are not, interferences or misalignment exist and must be corrected before proceeding.

   Do not leave the test truck on the platform for more than ten minutes.

4. Check for shift error. Record the test truck weight with the tandem axle centered as near as possible over each pair of load cells as shown in Figure 8.1. This reading must be within one graduation (20 pounds).

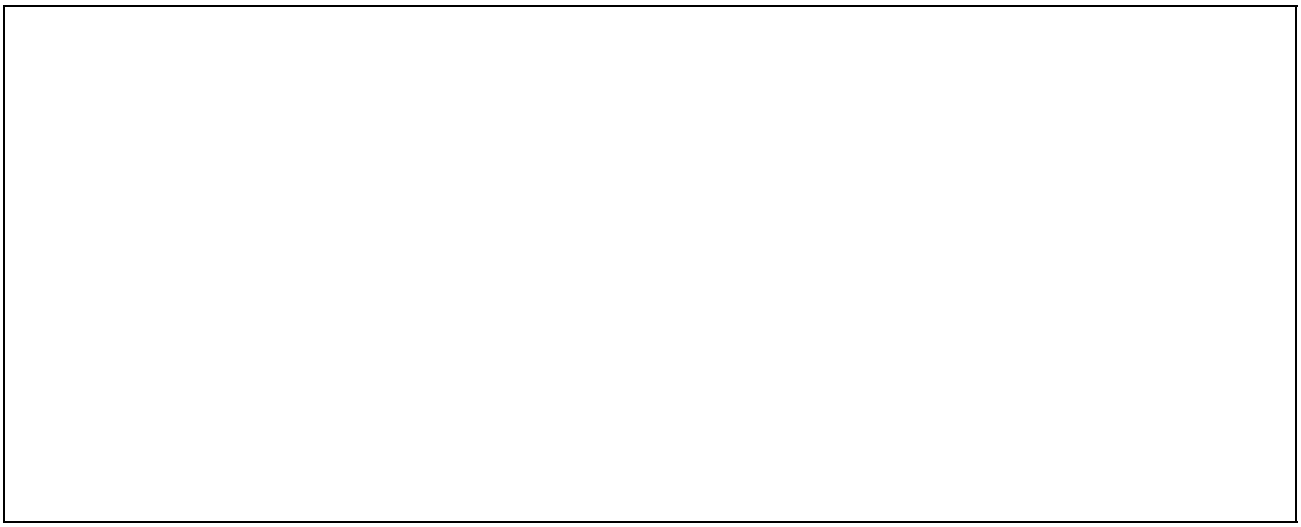


Figure 8.1 Testing Procedure

5. To perform the shift adjustment, find the section with the lowest reading, then calculate how many pounds the other sections must be reduced to bring them to an equal value. This will be error weight, the amount in pounds to be trimmed out.

6. Divide the test weight in pounds by the error weight in pounds. Multiply the resultant by the load cell resistance (775 ohms). The product will be the value in ohms of the trim resistor to be placed across each load cell output of each section that is to be adjusted.

$$\frac{\text{Test Weight}}{\text{Error}} \times \text{Load Cell Resistance} = \text{Trim Resistor Value}$$

EXAMPLE #1:

Test Weight = 20,000lb, Error Weight = 20 lb.
Load Cell Resistance = 775 Ohms

20,000/20 = 1000
1000 x 775 = 775,000 ohms
Use 750,000 ohms

EXAMPLE #2:

Where Test Weight = 20,000lb; Error Weight = 80lb; and

Load Cell Resistance = 775 ohms

20,000/80 = 250
250 x 775 = 193,750 ohms
Use 180,000 or 200,000 ohms for trimming.

NOTE: Round off resistance to nearest available value.

7. Solder the trimming resistors in the junction box. Make sure they are secure and then repeat steps 8.4.8.5.8.6 and 8.7 if necessary.

8.1 SPAN CALIBRATION

1. Set approximate span with load cell simulator.
2. Place 20,000 pounds of test weights on platform.
3. Adjust indicator to read 20,000 pounds.
4. Remove test weights. Do not place weights on the truck.
5. Drive empty truck on scale and record reading.
6. Remove truck. Scale will return to zero.
7. With truck off scale, load 20,000 pounds of test weights back on truck.
8. Drive truck with at least 20,000 pounds of test weights on scale. Adjust indicator to read weight of empty truck (per 8.8.5) plus 20,000 pounds.

8.2 LINEARITY

Place the 20,000 pounds of test weights on the scale in 3,000 pound increments and record the indication for each 3,000 pound increment. The deviation of the indication from the test load must be within 0.1 percent of the test load

8.3 FINAL CLOSURE OF JUNCTION BOX

After calibration is complete the junction box should carefully be sealed against moisture. Use RTV compound wherever cable enters junction box. Place the dehumidifier package in the box. Make sure the desiccant is in an active (dry) condition. Apply sealing grease to both sides of the gasket and assemble the gasket to cover. Attach cover to box, making sure that the grease does not become contaminated. Tighten cover bolts securely. Be careful that the bolts are not over tightened as this could warp the cover or force the gasket out of place,

FAILURE TO SEAL JUNCTION BOX AND MAINTAIN MOISTURE INDICATOR IN A BLUE CONDITION WILL CAUSE SERIOUS SCALE ERRORS.

Inform the owner of the need to periodically check the moisture indicator.

9.0 APPENDICES

9.1 APPENDIX B - 7530 INSTALLATION SCHEDULE

STEP	RESPONSIBILITY	EQUIPMENT OR TOOLS REQUIRED
1. Site Selection	Owner, with Mettler Toledo Scale Recommendations	Plans, Drawings for scale and proposed site.
2. Foundation Construction 1. Excavate 2. Lay Stone (if needed) 3. Form 4. Place Rebars 5. Pour Concrete 6. Level Base Plate 7. Cure concrete	 Contractor Contractor Contractor Contractor Contractor Contractor Contractor	 Back Hoe Forms Hand Tools Concrete Transit (See Chapter 4)
3. Assemble Weighbridge	Contractor	Test Truck with Boom (See Chapter 5)
4. Load Cell Installation 1. Raise Weighbridge 2. Install Load Cells	Mettler Toledo Scale/ Distributor or Contractor	 Jacks & Blocks Hand Tools (See Chapter 6)
5. Connect Wiring Wire L.C. to Junction Box and to Instrument	Mettler Toledo Scale/ Distributor or Contractor	Hand Tools (See Chapter 7)
6. Calibration	Mettler Toledo Scale/Distributor	Test Truck with Weights (See Chapter 8)
7. Approval	Weights and Measures Mettler Toledo Scale/ Distributor	Test Truck with Weights

Each step must be completed in sequence before the next step can be started.

* It is not necessary to wait the full curing time before going to the next step, but the full curing time must be allowed before loading the scale for calibration.

9.2 APPENDIX C - BOLT AND WRENCH SIZES AND TIGHTENING SPECIFICATIONS.

BOLT LOCATION	50,000 LB LOAD CELLS			100,000 LB LOAD CELLS		
	Bolt Size	Wrench Size	Tightening Method	Bolt Size	Wrench Size	Tightening Method
Weighbridge Bolts (A-490)	7/8	1-7/16	Twist Off ***	7/8	1-7/16	Twist Off ***
Top of Load Cell (A-325)	5/8	1-1/16	Turn-of-Nut** (half turn)	3/4	1-1/4	Turn-of-Nut** (half turn)
Bottom of Cell (Grade 8)	5/8	1/2”	Turn-of-Nut (half turn)	3/4	5/8*	Turn-of-Nut** (half turn)
Anchor Bolts (A-307)	3/4	1-1/8	Turn-of-Nut (1/4 turn)	7/8	1-5/16	Turn-of-Nut** (1/4 turn)

* Allen Socket

** Turn-of-Nut Tightening
The turn-of-nut method is used to provide the bolt tension required. First, all bolts shall be brought to ‘snug tight’ condition to insure that the parts of the joint are brought into contact with each other. “Snug tight” is defined as the tightness attained by a few impacts of an impact wrench of the full effort of a man using an ordinary spud wrench. Following this initial operation, all bolts in the connection shall be tightened additionally one half turn (except the A307 bolts which shall be one quarter turn), with tightening progressing systematically from the most rigid part of the join to its free edges. During the operation there shall be no rotation of the part not turned by the wrench.

*** Twist-off-Tightening
The weighbridge bolts have a special twist off head and use a special socket for the bolt head. The 1-7/16 wrench is to hold the nut from turning.

9.3 APPENDIX D - LOAD CELL CHARACTERISTICS

Excitation voltage 15 volts D-C or A-C. Rates Output 2 Millivolts per Volt.

Function	J-Box terminal Designations	Six (6) Conductor Load Cell Cable Color Code	Instrument Connector Pin Designations	Internal Resistance Measurement (ohms)
Plus (+) Signal	1	Green	E	775 ± 5 (E to B)
Minus (-) Signal	2	Black	B	
Plus (+) Excitation	5	White	A	825 ± 35 (A to C)
Minus (-) Excitation	4	Blue	C	0 Ohms (A to D)
Plus (+) Sense	6	Yellow	D	(C to F)
Minus (-) Sense	7	Red	F	
Shield	3	Orange	Not Connected	

Bridge Synmmetry Check: Place jumper between pins C and A. Measure the resistance from C to B and from C to E. The resistance should be 420 ± 2 Ohms.

There is a jumper oin the load cell between pins A and D and also between pins C and F.

The resistance measurements checks can be made right at the junction box if the leads are disconnected from the terminal block. The resistance of the interconnecting cable is small enough that it will not affect the above readings(except the symmatry check).