7531

Concrete Deck DigiTOL® Truckmaster® Weighbridge

Installation and Service Manual

15872700A
(1/00).00

METTLER TOLEDO

Publication Revision History

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

Publication Name: METTLER TOLEDO 7531 DigiTOL TRUCKMASTER Installation and Service Manual

Publication Part Number: IS007531I01 Publication Date: 4/93

Part Number	Date	Revisions
~~15632800A~~	11/99	Reformatted manual, updated installation procedure, and changed part number to TEDS number.
15872700A	1/00	Replaced incorrect TEDS number from 11/99 revision.

INTRODUCTION

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

Information about METTLER TOLEDO Technical Training may be obtained by writing, calling, or faxing:

METTLER TOLEDO
1900 Polaris Parkway
Columbus, Ohio 43240 USA
phone: (614) 438-4511
fax: (614) 438-4958
www.mt.com

FCC Notice

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

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

PRECAUTIONS

READ this manual BEFORE operating or servicing this equipment.

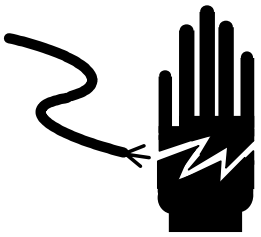
FOLLOW these instructions carefully.

SAVE this manual for future reference.

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

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

CALL METTLER TOLEDO for parts, information, and service.



⚠ WARNING

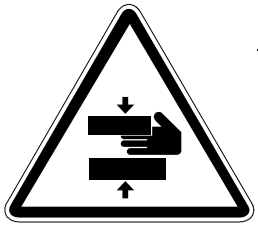
PERMIT ONLY QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND, ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY HARM.

⚠ CAUTION

THE TOP REBAR MUST BE PLACED TO CLEAR THE ANCHOR BOLTS. REFER TO THE FOUNDATION DRAWINGS FOR ANCHOR BOLT LOCATIONS.

⚠ WARNING

WEIGHBRIDGE MODULES SHOULD ALWAYS BE MOVED SLOWLY AND CAREFULLY TO AVOID MECHANICAL SHOCK. MAKE SURE THAT THE LIFTING DEVICE USED TO MOVE THEM HAS A SUFFICIENT CAPACITY TO HANDLE THE MODULES SAFELY AND SECURELY.



⚠ WARNING

WHEN A MODULE IS BEING MOVED, DO NOT PLACE YOUR HANDS OR OTHER ITEMS BETWEEN THE MODULE AND ANY OTHER SURFACE. IF IT IS NECESSARY TO PLACE YOUR HANDS UNDER A MODULE DURING INSTALLATION, MAKE SURE THAT THE MODULE IS PROPERLY BLOCKED SO THAT IT CANNOT MOVE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN BODILY HARM OR PROPERTY DAMAGE.

⚠ WARNING

LIFT THE MAIN BEAMS WITH A CRANE, FORKLIFT, TEST TRUCK BOOM, OR OTHER TYPE OF EQUIPMENT. EACH MAIN BEAM CAN WEIGH AS MUCH AS 1,500 POUNDS. ATTEMPING TO LIFT THE BEAMS MANUALLY CAN RESULT IN INJURY.

CONTENTS

1 Introduction

The Model 7531 DigiTOL® TRUCKMASTER® truck scale features a concrete deck and a low-profile weighbridge for installation above ground. It has a 45K tandem-axle capacity and is designed for weighing highway vehicles, not for weighing concentrated-load vehicles such as heavy-capacity forklifts.

A Model 7531 truck scale consists of one or more modules (10 or 11 feet wide) with side rails. The modules can be connected to form a single scale with a platform 10 to 100 feet long (platforms longer than 100 feet are available as special orders). The 7531 weighbridge is a nominal 19 1/2 inches high with approximately 11 5/8 inches of clearance between the bottom of the main girders and the foundation. A scale's nominal capacity varies with its length (see Table 6-1).

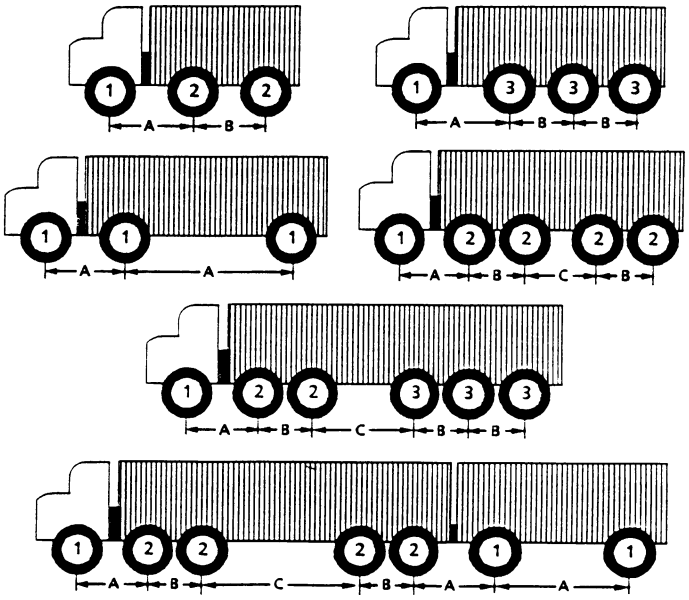
The modules are supported by DigiTOL POWERCELL® load cells.

Maximum Loading

Use the information in Figure 1-1 to determine the maximum allowable weight loading for different types of axle arrangements.

Axle Number	Load Specifications
1	Single
2	Tandem
3	Tri-Axle

Spacing Between Axles		
A = More than 96 inches	B = 48 to 96 inches	C = More than 128 inches



Platform Size	Maximum Gross Weight	Maximum Axle Load		
		Single Axle	Tandem per Axle	Tri-Axle per Axle
60 feet x 10 feet	200,000 lb	25,000 lb	45,000 lb	55,400 lb
70 feet x 10 feet	200,000 lb	25,000 lb	45,000 lb	55,400 lb

Figure 1-1: Maximum Loading for Low-Profile Truck Scales

Federal Bridge Formula

The Federal Bridge Formula (enacted January 4, 1975) is used to determine the gross weight allowed to be carried on any group of two or more consecutive axles:

$$W = 500 [LN/(N-1) + 12N + 36]$$

where:

W = Maximum weight in pounds carried on any group of two or more consecutive axles computed to the nearest 500 lb.

L = Distance in feet between the extremes of any group of two or more consecutive axles.

N = Number of axles in group under consideration.

7531 DigiTOL TRUCKMASTER Rating

The Federal Bridge Formula provides a 34K tandem-axle rating. This rating specifies a 34,000-lb weight limit for tandem axles spaced between 40 and 96 inches. Since the 7531 truck scale has a 45K rating, you must multiply the results of the Federal Bridge Formula by a factor (r) of 1.32 to determine the maximum weight that can be carried on any group of two or more consecutive axles.

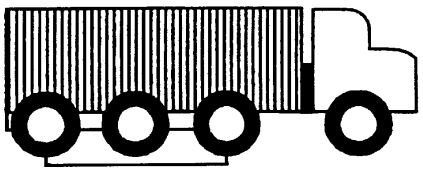
$$W1 = W \times 1.32$$

where:

W1 = Maximum weight to be carried on any group of two or more consecutive axles for vehicles to be weighed on a 7531 truck scale.

Example:

Determine the maximum weight that can be carried on the back three axles of the truck shown below in order for it to be weighed on the 7531 weighbridge.



L = 14 feet

According to the Federal Bridge Formula, W = 46,500 lb (for N = 3 and L = 14 feet)

$$W1 = 46{,}500 \times 1.32$$
$$= 61{,}500 \text{ lb (rounded to the nearest 500 lb)}$$

The maximum weight that can be carried across the scale by this three-axle grouping (which loads the scale over a 14-foot distance) is 61,500 lb.

2 Site Selection and Preparation

Site Requirements

The site selected for the scale must meet state and local requirements. The following is taken directly from Handbook 44 (H-44) 1999 edition issued by the National Institute of Standards and Technology:

> "UR.2.6. Approaches.
>
> UR.2.6.1. Vehicle Scales. - On the entrance and exit ends of a vehicle scale installed in any one location for a period of 6 months or more, there shall be a straight approach as follows:
>
> (a) the width at least the width of the platform,
>
> (b) the length at least one-half the length of the platform but not required to be more than 12 m (40 ft), and
>
> (c) not less than 3 m (10 ft) of any approach adjacent to the platform shall be constructed of concrete or similar durable material to ensure 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 concentrated load capacity of the scale may be installed in this portion. Any slope in the remaining portion of the approach shall ensure (1) ease of vehicle access, (2) ease for testing purposes, and (3) drainage away from the scale."
>
> Note: The scale drawings provided meet part (a) of this requirement. The site must be located to meet parts (b) and (c).

Other requirements or considerations:

- The site should have good drainage. Surrounding areas should not drain through the site. The ideal scale site is on ground that is higher than the surrounding area.
- Make sure there are no buried pipes, sewer lines, wires, or foundations that would interfere with footing construction.
- The scale should be located away from high-power electrical transmission lines or substations.
- The site should have enough room to align trucks with the scale platform before pulling them onto the platform. This is especially important if trucks must turn before pulling onto the scale. There should also be enough room for trucks to pull off the scale.
- Trucks should not be left on the scale for longer than is necessary to take a vehicle weight reading.
- Some jurisdictions require that the scale platform be visible from the location of the scale instrument. Others allow the use of a closed-circuit TV or a voice intercom. Obtain official approval before starting construction.
- Provide clearance on at least one side of the scale for the full length of the platform to allow for testing and calibration.

Foundations

The foundation has been designed to support a 7531 truck scale rated for 100 tons, assuming the ground has a bearing surface of at least 2,500 pounds per square foot. If the soil bearing pressure is less than 2,500 pounds per square foot, it must be increased to this level before pouring the foundation.

Install the foundation according to the correct drawing (see the list of drawings on page 9-4). Make sure that the end walls are parallel and measure the same distance diagonally within 1/2 inch. The instrument cable conduit should be in place before the slab is poured.

Base Plates

At the locations of the base plates, the concrete should be level and in the same plane (within ± 1/8 inch). The rest of the foundation should be graded slightly for drainage.

⚠ CAUTION

THE TOP REBAR MUST BE PLACED TO CLEAR THE ANCHOR BOLTS. REFER TO THE FOUNDATION DRAWINGS FOR ANCHOR BOLT LOCATIONS.

Curing

Let the concrete foundation cure for 7 to 10 days before installing the scale. Expanding anchor bolts should be installed after the foundation has cured, so that the anchors will seat correctly. Do not allow traffic or loading on scale until concrete reaches full strength, normally in 28 days.

3 Receiving and Inspection

Inspection

Check off all items received against the shipping bill of lading. If any items are missing, notify the carrier immediately in order to collect damages.

Inspect all items received. If there is any physical damage, please notify your carrier immediately in order to collect damages.

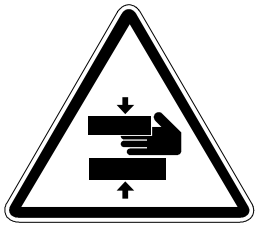
A 7531 truck scale consists of five major types of parts:

1. DigiTOL TRUCKMASTER Weighbridge Main Beams
2. DigiTOL TRUCKMASTER Weighbridge Cross Beams
3. DigiTOL POWERCELL Load Cells
4. Indicator and POWERCELL Cable
5. Installation Kit (Junction Boxes, Cables, Tie Rods, Foundation Bumper Brackets, Shims, Anchor Bolts)

Lightning protection system components and home run cable are supplied if ordered.

⚠ WARNING

WEIGHBRIDGE MODULES SHOULD ALWAYS BE MOVED SLOWLY AND CAREFULLY TO AVOID MECHANICAL SHOCK. MAKE SURE THAT THE LIFTING DEVICE USED TO MOVE THEM HAS A SUFFICIENT CAPACITY TO HANDLE THE MODULES SAFELY AND SECURELY.



⚠ WARNING

WHEN A MODULE IS BEING MOVED, DO NOT PLACE YOUR HANDS OR OTHER ITEMS BETWEEN THE MODULE AND ANY OTHER SURFACE. IF IT IS NECESSARY TO PLACE YOUR HANDS UNDER A MODULE DURING INSTALLATION, MAKE SURE THAT THE MODULE IS PROPERLY BLOCKED SO THAT IT CANNOT MOVE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN BODILY HARM OR PROPERTY DAMAGE.

Unloading Procedure

If the 7531 truck scale is being delivered by a METTLER TOLEDO truck, unloading will be handled and supervised by the METTLER TOLEDO driver. Otherwise, unband the beams and lift them individually.

⚠ WARNING

LIFT THE MAIN BEAMS WITH A CRANE, FORKLIFT, TEST TRUCK BOOM, OR OTHER TYPE OF EQUIPMENT. EACH MAIN BEAM CAN WEIGH AS MUCH AS 1,500 POUNDS. ATTEMPING TO LIFT THE BEAMS MANUALLY CAN RESULT IN INJURY.

Approximate weights of assembled modules are listed in Table 3-1.

Size and Type of Assembled Module	Approximate Weight
20-foot Module without Concrete	3,100 lb
20-foot Module with Concrete	23,900 lb
25-foot Module without Concrete	4,000 lb
25-foot Module with Concrete	30,000 lb

Figure 3-1: Approximate Weights of Assembled Modules

4 Installation Supplies Checklist

To install a 7531 truck scale, you will need normal installation tools plus the following tools and material. They are not supplied by METTLER TOLEDO.

Tools

- Transit, tripod, rod, and 6-inch spirit level
- 100-foot measuring tape
- 100-foot chalk line
- 100-foot extension cords, 3/#14 wire
- Hammer drill, 1-inch or greater capacity
- 3/4-inch carbide drill bit at least 18 inches long for anchor bolts
- 6-foot crowbar to align modules
- Beckman or Fluke digital multimeter, 100+ meg ohm for insulation, wiring, and ground check
- Socket set and wrenches:
  - 1 7/8 inches for 1 1/4-inch tie rod nuts
  - 2 1/4 inches for 1 1/2-inch end bumper bolts
  - 1 1/8 inches for 3/4-inch anchor bolt nuts
  - 1 1/2 inches for 1-inch cross beam assembly bolts
  - 4-foot breaker bar or torque wrench (3/4-inch drive extension) for tie rod
- Air compressor or air pressure tank (with nozzle to blow out anchor bolt holes)
- Locating tools (supplied only if scale is delivered by METTLER TOLEDO delivery system; otherwise, they must be purchased—Part No. TA200831)
- Welding apparatus (not normally used, but might be required)

For Concrete Deck:

- Vibrator
- 200 feet of duct tape
- Concrete finishing tools
- Lumber, 2 inches by 4 inches by 10 feet (1-inch bow at center)
- Curing compound manufactured by W.R. Grace Co. or equal.

Material

- Corrugated sheeting or plywood for deck.
- Shoring (4 x 4 lumber) to support corrugated sheeting or plywood.
- A small supply of Never-Seez bearing compound or a quality grease.
- Non-shrink, high-quality grout and mixing tools (not normally used, but might be required).

Weighbridge Installation Checklist

This list summarizes the basic steps required for proper installation of a 7531 truck scale on a dimensionally correct foundation.

	Check (✓) When Completed
1. Make sure that you have all parts needed	
2. Position the main beams	
3. Position the cross beams	
4. Set the base plates	
5. Set modules on locating tools	
6. Make sure scale is centered on foundation and level	
7. Tighten tie rods	
8. Insert beam alignment shims	
9. Check base plate alignment (Verify that locating tools are vertical)	
10. Drill anchor holes and insert anchors (Do not drill until steps 8 and 9 are complete)	
11. Form deck support and install rebar	
12. Pour concrete and allow it to cure	
13. Replace locating tools with load cells	
14. Mount side bumper brackets	
15. Set bumpers (Side: 1/16 inch max.; End: 1/8 inch max.)	
16. Connect cables according to the wiring diagram	
17. Calibrate scale after deck has cured	

5 Installation

Prepare the Foundation

1. Install the concrete foundation and allow it to cure. For details about how to select a site and install the foundation, refer to Chapter 2 and the foundation drawing for the scale. To meet NIST Handbook 44 requirements, you must install a rock guard on the curb angle at each end of the scale foundation (see the foundation drawing).
2. Check the foundation's dimensions to make sure they are correct. The foundation's end walls should be parallel and measure the same distance diagonally within 1/2 inch.
3. Unpack the scale and check the bill of materials to make sure that you have received all the parts.
4. Use a chalk line to mark the centerlines for the load cells and main beams on the foundation.
5. Position the base plates on the foundation (see Figure 5-1). At this time, each base plate should be level, and all base plates should be in the same level plane.

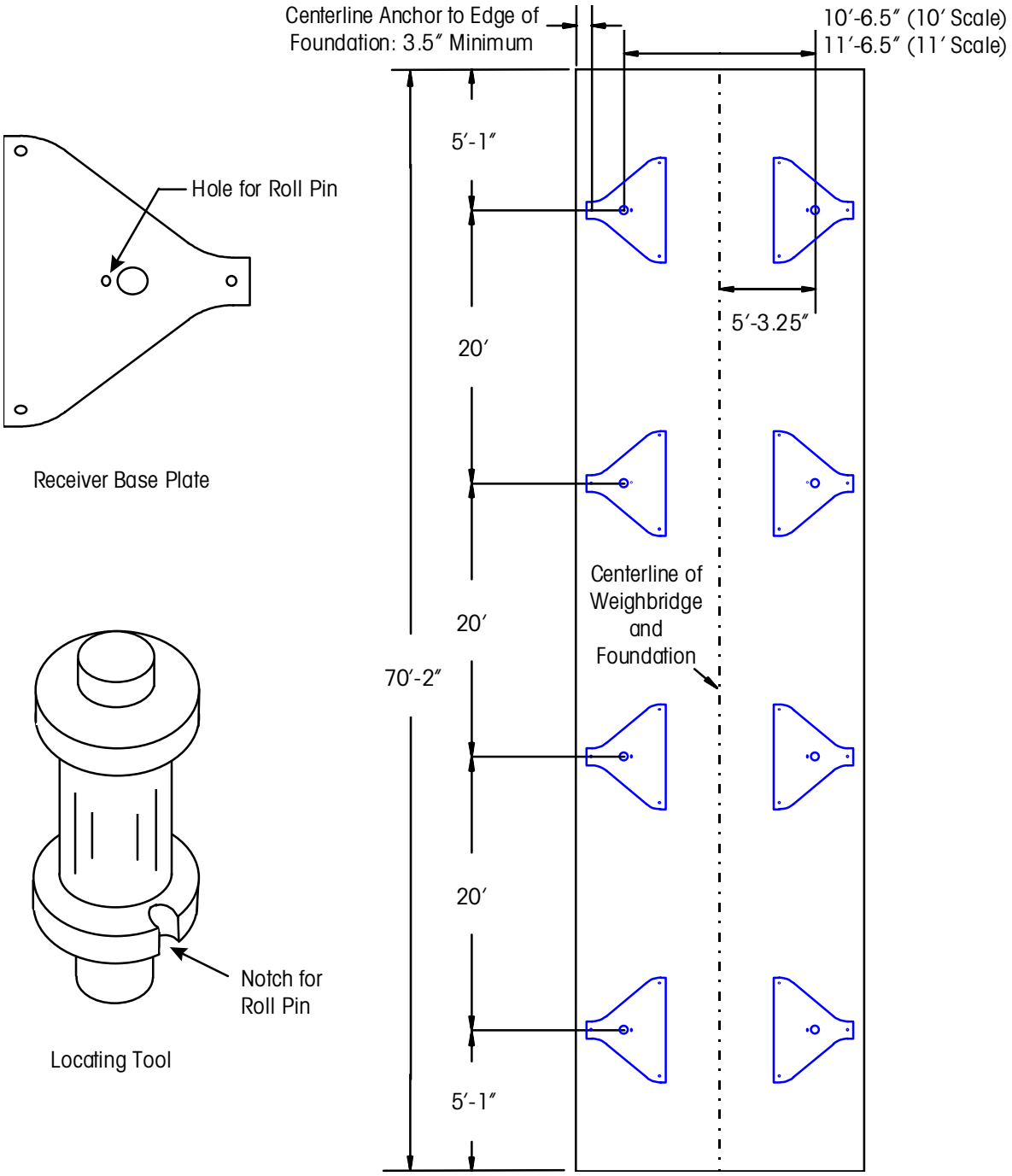


Figure 5-1: Base Plate Locations for Multi-Module Scale

Assemble the Modules

1. Place wood timbers across the floor of the foundation to support the modules and decking when the concrete is poured. Wood timbers should be stacked 11 inches high to allow room for the locating tools (see Figure 5-2). If you are using corrugated decking, follow the manufacturer's recommendations for spacing lateral supports.

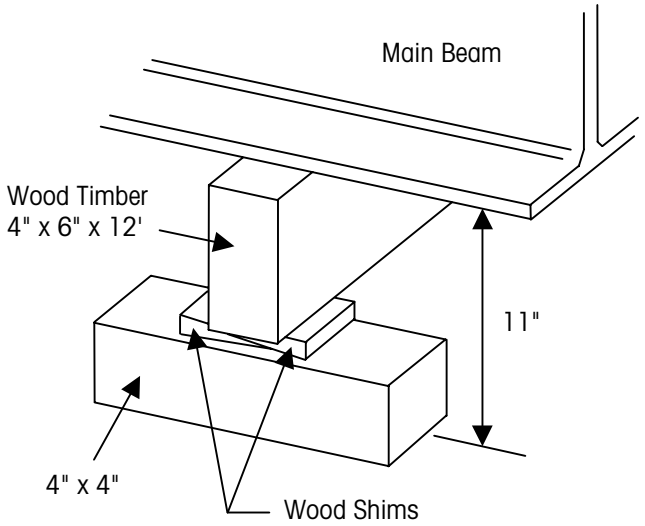


Figure 5-2: Support for Beams

⚠ WARNING

LIFT THE MAIN BEAMS WITH A CRANE, FORKLIFT, TEST TRUCK BOOM, OR OTHER TYPE OF EQUIPMENT. EACH MAIN BEAM CAN WEIGH AS MUCH AS 1,500 POUNDS. ATTEMPING TO LIFT THE BEAMS MANUALLY CAN RESULT IN INJURY.

2. Position the main beams for one of the end modules on the wood timbers. For two-module scales, the first module you install should be the one with transfer bars. The main beams should be square with the foundation. The distance between the centers of the two main beams should be within 1 inch of the measurement shown on the installation drawing.

3. Place the cross beams on the inside bottom flanges of the main beams at the locations where there are bolt holes in the main beams (see Figure 5-3). The cross beams can be moved by two workers or with the same equipment used to lift the main beams. Be sure to place the cross beams with anchor hooks at the end of each module. The anchor hooks should be in the concrete when the deck is poured.

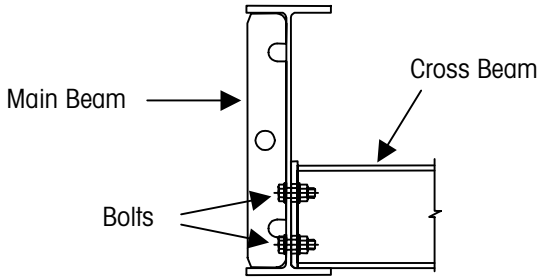


Figure 5-3: Attaching Cross Beam to Main Beam

4. Loosely attach the cross beams to the main beams using two 1-inch diameter bolts for each connection (see Figure 5-3).
5. Assemble the main beams and cross beams for the other modules. If the scale has three or more modules, install both end modules before the middle module(s). The end modules have transfer bars and must be in place so that the adjoining modules can rest on the transfer bars (see Figure 5-4).
6. Use tie rods to loosely connect the main beams of adjoining modules (see Figure 5-4). Leave no gap between the transfer bar and alignment block (multiple module scales only).

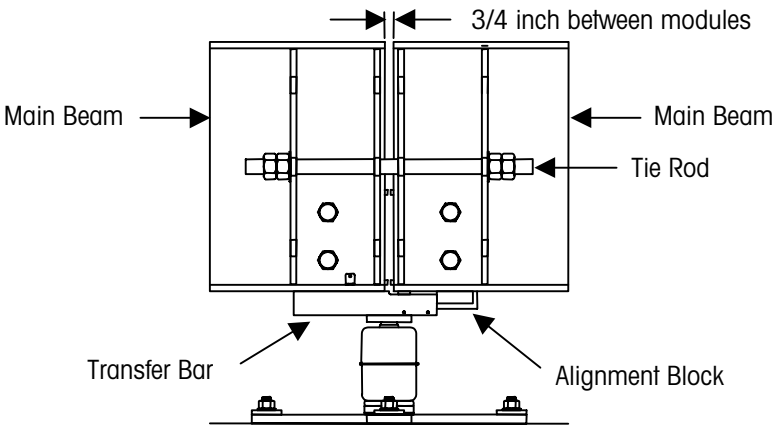
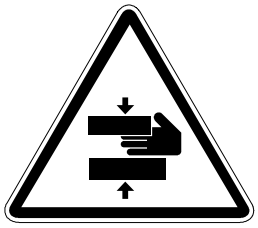


Figure 5-4: Connecting Main Beams

7. Once all modules are in position and loosely assembled, make sure that the scale is square. Also verify that the gap between the end wall and the last cross beam is approximately 3/4 inch.
8. Tighten all cross beam bolts. Each nut should be tightened one half turn past the point where it is snug.
9. Tighten and lock nut all tie rods.

Install Locating Tools

To install the locating tools, you will need to jack up the scale slightly. Be careful to jack up the modules that have transfer bars first. Otherwise, the weight of the modules will be placed on the tie rods. Because the tie rods are not designed to support the weight of a module, this could be dangerous.



⚠ WARNING

WHEN A MODULE IS BEING MOVED, DO NOT PLACE YOUR HANDS OR OTHER ITEMS BETWEEN THE MODULE AND ANY OTHER SURFACE. IF IT IS NECESSARY TO PLACE YOUR HANDS UNDER A MODULE DURING INSTALLATION, MAKE SURE THAT THE MODULE IS PROPERLY BLOCKED SO THAT IT CANNOT MOVE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN BODILY HARM OR PROPERTY DAMAGE.

Use a transit to determine how many shims will be needed at each load cell. Then install each locating tool, using the following procedure (see Figure 5-5):

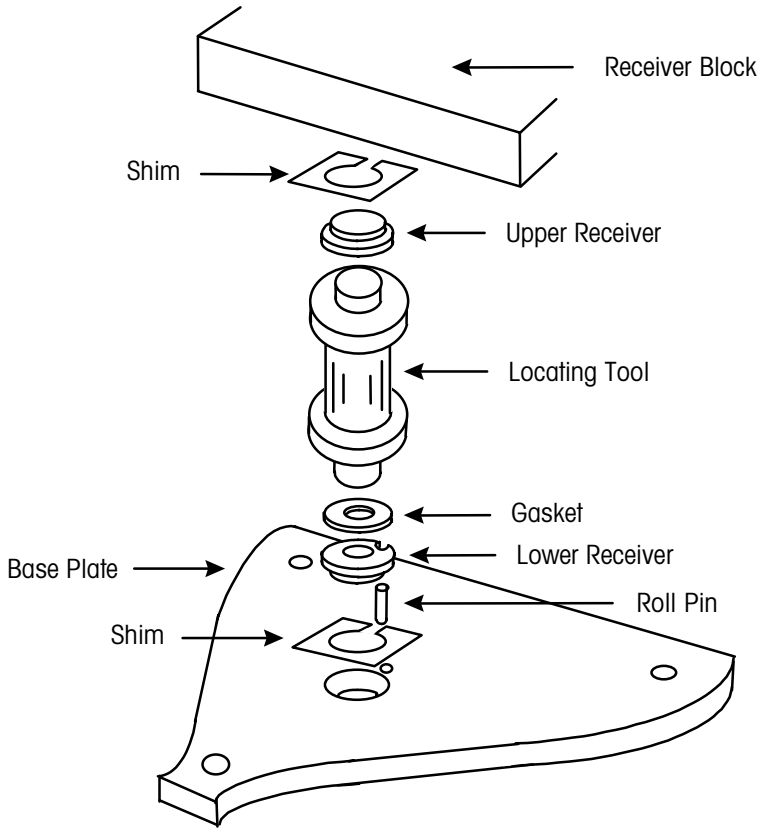


Figure 5-5: Installing Locating Tools

1. Place a roll pin in the base plate.
2. Install the lower receiver with the appropriate shims under the receiver. If possible, use an equal number of shims for the upper and lower receiver. There should not be more than 3/8 inch of shims at either receiver. The maximum shim thickness at any load cell should be 3/4 inch.
3. Grease the O-ring on the upper receiver so that it slides into place easier. Install the upper receiver in the receiver block on the underside of the main beam, with any shims between the receiver and the block.
4. Install the locating tool so that one end fits into the upper receiver and one end into the lower receiver. Position the notch on the side of the locating tool so that the roll pin fits into it.
5. Make sure that all locating tools are vertical. There should be no gap between the flanges on the locating tool and the upper and lower receivers.
6. Square the base plates. In order to move the base plates, you might need to use a pry bar to lift the module slightly while another person taps the base plate with a hammer.
7. Anchor the base plates to the foundation with anchor bolts (torque to 180 ft-lb).
8. If necessary, install lateral shims between the transfer bars and alignment blocks to prevent the modules from moving side to side.

NOTE: The deck is set up to drain to the ends of each module, as shown in Figure 5-6. So the entire deck is not in the same level plane.

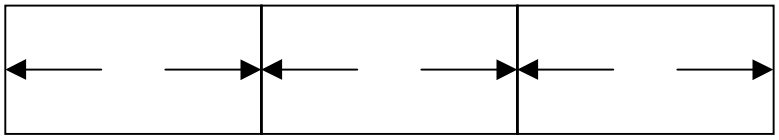


Figure 5-6: Plan View Showing Drainage Direction for Modules

Install Decking

Place plywood or corrugated decking under each section of each module to support the concrete deck. You can install the corrugated decking as a permanent part of the concrete deck or as a temporary means of shoring up the concrete until it has cured.

Installing Permanent Corrugated Decking

1. Place the corrugated decking (28 gauge minimum) in each section of the scale so that it rests on the bottom flanges of the main beams and cross beams. The corrugations should run parallel to the direction that vehicles will travel along the scale.
2. The decking should fit tightly against the bottom of the beam flanges to keep concrete from leaking between the beams and the decking.

Installing Temporary Decking

1. Place the plywood or corrugated decking (28 gauge minimum) in each section of the scale. It should fit between the support lumber and the underside of the cross beams. If corrugated decking is used, the corrugations should run parallel to the direction that vehicles will travel along the scale.
2. The decking should be shored up with lumber so that it fits tightly against the bottom of the beam flanges to keep concrete from leaking between the beams and the decking. If necessary, use wood shims to get the decking to fit tightly.
3. Lay thin plastic sheeting (≈ 4 mil) over the decking to keep the concrete from sticking to the plywood or corrugated decking.

Pour the Concrete

1. Install rebar as shown in the general layout drawing provided in the parts kit. Pay close attention to the elevation of the rebar. It is important to use rebar chairs with the correct height.
2. The rebar should be tied together to make sure it stays in the correct position as the concrete is being poured.
3. Install conduit for the load cell cables. Run the conduit through the openings in the main beams as shown on the installation drawing.
4. Apply duct tape to the top flanges of the cross beams, so that concrete spatter can be removed easily.
5. Pour the concrete so that it forms a flat surface even with the top flange of the cross beams.
   - Use 4,000-psi concrete with a 28-day cure.
   - 4-inch maximum slump; 5% to 7% air entrainment.
   - Do not pour at temperatures below 40°F (4°C).
6. Be sure that the concrete is allowed to cure according to the ACI code book of best practices.
7. If you used temporary decking, remove the decking after the concrete has cured. Use a knife to remove all plastic sheeting from the bottom of the concrete deck. If the sheeting is not removed, it will collect water and adversely affect the scale's performance.

Adjust the Bumpers

1. Adjust longitudinal bumpers so that there is a 1/8-inch gap between the bumpers and the end walls of the foundation. Tighten the lock nuts.
2. Mount lateral bumpers on the end wall of the concrete foundation, using the anchor bolts supplied in the parts kit. The lateral bumper bolt head should hit near the center of the longitudinal bumper block. Use shims to adjust the lateral bumper gap to 1/16 inch, and tighten the nut.

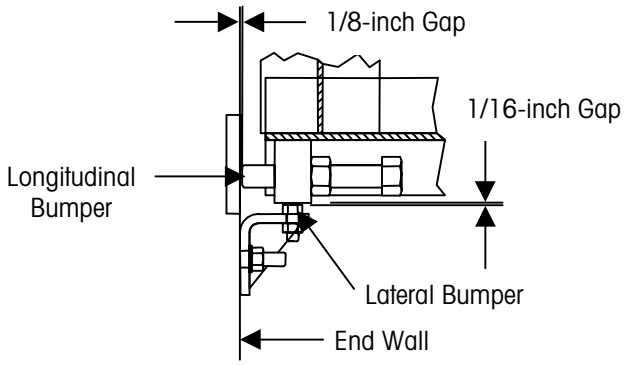
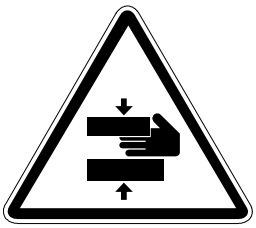


Figure 5-7: Plan View of Bumpers

Install the Load Cells

In order to install the POWERCELL load cells, it will be necessary to jack up the scale slightly. Be careful to jack up the modules that have transfer bars (and upper receiver blocks) first. Because the tie rods are not designed to support the weight of a module, this could be dangerous.



⚠ WARNING

WHEN A MODULE IS BEING MOVED, DO NOT PLACE YOUR HANDS OR OTHER ITEMS BETWEEN THE MODULE AND ANY OTHER SURFACE. IF IT IS NECESSARY TO PLACE YOUR HANDS UNDER A MODULE DURING INSTALLATION, MAKE SURE THAT THE MODULE IS PROPERLY BLOCKED SO THAT IT CANNOT MOVE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN BODILY HARM OR PROPERTY DAMAGE.

Install each load cell, using the following procedure:

1. Remove the locating tool.
2. Apply load cell receiver lubricant to the top and bottom pin of the load cell.
3. Fill the lower receiver with multi-purpose grease.
4. Position a load cell gasket on top of the lower receiver.
5. Install the load cell. The load cell cable connector should be on the upper half of the cell. The hex pin should be in the lower receiver.

Wire the Load Cells

Install wiring according to the 7531 wiring diagram (see page 9-4 for drawing numbers). All necessary parts are included in the wiring parts kit.

1. Mount the junction box(es) at the weld studs on the outside of the main beam. Locations are shown on the wiring diagram.
2. Connect all load cell cables to the terminals in the junction box.
3. Route the load cell cables through the conduit or conduit straps.
4. Dress the load cell cables to form a drip loop. This will allow water to drip off of the cable and not run into the connector.
5. Coil excess cable at the gusset near the load cell. Tie wraps have been provided in the wiring parts kit.
6. Before attaching the cable to the load cell, make sure that both connectors are clean, dry, and free from debris. If a connector has been contaminated, clean it with spray solvent before continuing.
7. Fill the connector with dielectric compound.
8. Attach the connectors during the POWERCELL addressing sequence described in the indicator manual. Do not use tools on the connector. If you cannot assemble it easily by hand, check for debris.

Check the Finish

1. Check the scale for any damage to the finish.
2. Remove duct tape from the cross beams.
3. Remove any other concrete spatter that might remain on the scale.
4. Clean all areas where the paint has been scratched, using mineral spirits or lacquer thinner.
5. Immediately spray paint all scratched areas, using the touch-up paint provided in the parts kit. Follow the paint manufacturer's instructions.
6. Allow the concrete to cure for 28 days before opening the scale for traffic.

Seal the Junction Box

1. Calibrate the scale according to the instructions in the indicator manual.
2. After calibration is complete, place a desiccant bag in the junction box and seal the box against moisture.
3. Carefully tighten the junction box lid bolts. The bolts should be torqued to 20 in-lb. Do not over tighten the bolts, because the threads could be damaged.

6 Scale Indicator Setup for 7531

Instructions for programming and calibrating the scale indicator can be found in the indicator's manual. The following 7531 setup information will be needed.

Total Capacity	Scale Length	Programmed Capacity	Increment Size
35 Tons*	Less than or equal to 25 feet	70,000 lb	20 lb
60 Tons*	Greater than 25 feet Less than or equal to 60 feet	120,000 lb	20 lb
100 Tons*	Equal to or greater than 60 feet	200,000 lb	20 lb

*Check serial plate on scale for total capacity.

Table 6-1: Scale Capacity and Increment Size

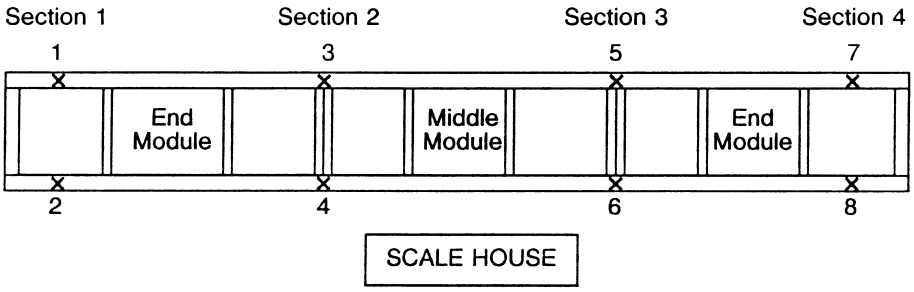


Figure 6-1: Recommended Power Cell Addressing

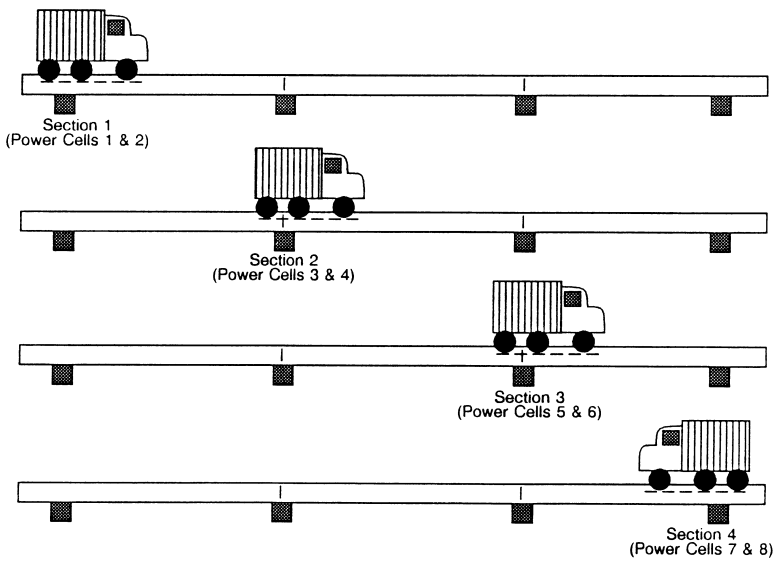


Figure 6-2: Test Truck Positions for Shift Compensation

End Cell Raw Count Range		
Module Size	**Without Concrete**	**With Concrete**
Single Module		
10 feet	800 - 1,250	4,950 - 7,150
12 feet	830 - 1,530	6,060 - 8,460
20 feet	1,500 - 2,400	10,550 - 13,550
25 feet	2,000 - 2,900	13,500 - 16,500
End Module		
20 feet	1,850 - 2,750	12,500 - 15,500
25 feet	2,650 - 3,550	17,200 - 20,200

Table 6-2: Expected Raw Count Readings for Model 7531

Middle Cell Raw Count Range		
Module Size	**Without Concrete**	**With Concrete**
20 ft End to 20 ft End	2,800 - 3,700	17,800 - 20,800
25 ft End to 25 ft End	3,250 - 4,150	20,600 - 23,600
20 ft End to 20 ft Middle	3,150 - 4,050	20,200 - 23,200
25 ft End to 20 ft Middle	3,370 - 4,270	21,600 - 24,600
20 ft Middle to 20 ft Middle	3,450 - 4,350	22,600 - 25,600

Table 6-3: Expected Raw Count Readings for Model 7531

7 Maintenance

Frequency

Since the scale has no moving parts, it requires only minimum maintenance. But normal service inspection schedules are recommended.

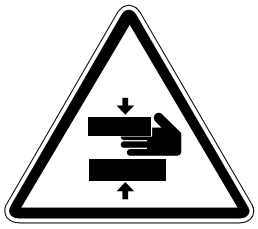
The structural steel that forms the scale platform is painted with an epoxy paint. You will need to repaint it occasionally. Before repainting, clean the metal surfaces and remove all rust. The easiest method for painting the platform is with paint rollers. Use an epoxy paint, and apply it at temperatures of 60°F (15°C) or higher.

- Check the calibration of the scale every six months.
- Check the bumper bolts and adjust them if necessary.
- Check the junction box desiccant bags and replace them as required.

Load Cell Replacement

If a POWERCELL load cell needs to be replaced, use the following procedure:

1. Raise the platform, using a hydraulic jack, test truck, boom, or forklift. The scale should be raised only when it is unloaded. If you are going to lift a middle module, first loosen the tie rods. Then lift the module that bears on the coupler bracket first and block it up before attempting to lift the adjoining module off the load cell. Refer to the module weights listed in Table 3-1. Decks with concrete must be lifted from the bottom of the deck. To remove a DigiTOL load cell, a scale needs to be lifted approximately 1.5 inches.



⚠ WARNING

WHEN A MODULE IS BEING MOVED, DO NOT PLACE YOUR HANDS OR OTHER ITEMS BETWEEN THE MODULE AND ANY OTHER SURFACE. IF IT IS NECESSARY TO PLACE YOUR HANDS UNDER A MODULE DURING INSTALLATION, MAKE SURE THAT THE MODULE IS PROPERLY BLOCKED SO THAT IT CANNOT MOVE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN BODILY HARM OR PROPERTY DAMAGE.

2. After the scale is raised up and blocked, enter the setup mode on the indicator and access the load cell replacement parameter. Follow the indicator manual's instructions for replacing a load cell.
3. After installing the replacement load cell, be sure to retighten the tie rod.
4. Check the calibration of the scale and recalibrate if required.

Spare Parts List

Part Number	Description
14002500A	POWERCELL, 22,500 kg CMOS
TA200764	Upper Receiver
TA200814	Lower Receiver, Hexagonal
TN203173	Gasket
TA200712-1	Receiver Shim, 0.125 inch
TA200712-2	Receiver Shim, 0.062 inch
TA200712-3	Receiver Shim, 0.180 inch
13635300A	CMOS Junction Box PCB
TA200831	Locating Tool

Note: See 7531 wiring diagram for load cell cables and junction box assembly.

Load Cell Specification

Model: 0760, National Type Evaluation Program (NTEP) Certificate of Conformance Number 88-091 for Class IIIL, 10,000 divisions.

Capacity: 22,500 kg / 49,604 lb

Material: Stainless Steel

Environmental Protection: Hermetically Sealed

Output: METTLER TOLEDO DigiTOL Protocol

Scale Certification

National Type Evaluation Program (NTEP) Certificate of Conformance Number 92-204 for Class IIIL, 10,000 divisions.

8 Cast-in-Place Concrete Recommendations

General

Work including: Providing all cast-in-place concrete work, including reinforcing, placing, curing, and cleanup.

Submit, on request only, product literature for admixtures and curing compounds proposed for use.

Materials

Cement: Portland Cement, ASTM C150-82, Type 1

Water: Potable

Aggregates: ASTM C33, size number 57

Admixtures:

- Water-reducing: ASTM C494-79, Type A or D
- Air-entraining: ASTM C260-77
- High-range, water-reducing admixture (superplasticizer): ASTM C494, Type F or G
- Nonchloride, noncorrosive accelerator: ASTM C494, Type C or E
- Calcium Chloride is **NOT** permitted.
- Use of mixtures other than those listed will not be permitted.

Reinforcing

Deformed bars: ASTM A615, A616, or A617. Yield strength to be 60 ksi.
Welded wire fabric (if required): ASTM A185-79. Provide in sheet form.

Curing Compound and Sealer: Federal Specification TT-C-800A. The compound shall be a styrene butadiene type, 30% solids content minimum. The following are acceptable:

- Super Floor Coat, by Euclid
- Super Pliocure, by Euclid
- Masterseal 66, by Master Builders

Mixes

Use the following for exterior slabs on grade:

- Compressive strength to be 4,000 psi (or as specified on foundation drawing), 28-day strength.
- Air content shall be 5% to 7%.
- Maximum water to cement ratio shall be 0.45.
- Maximum slump as placed shall be 4 inches.

Finish

Finish on flatwork shall be medium broom finish.

Curing and Protection

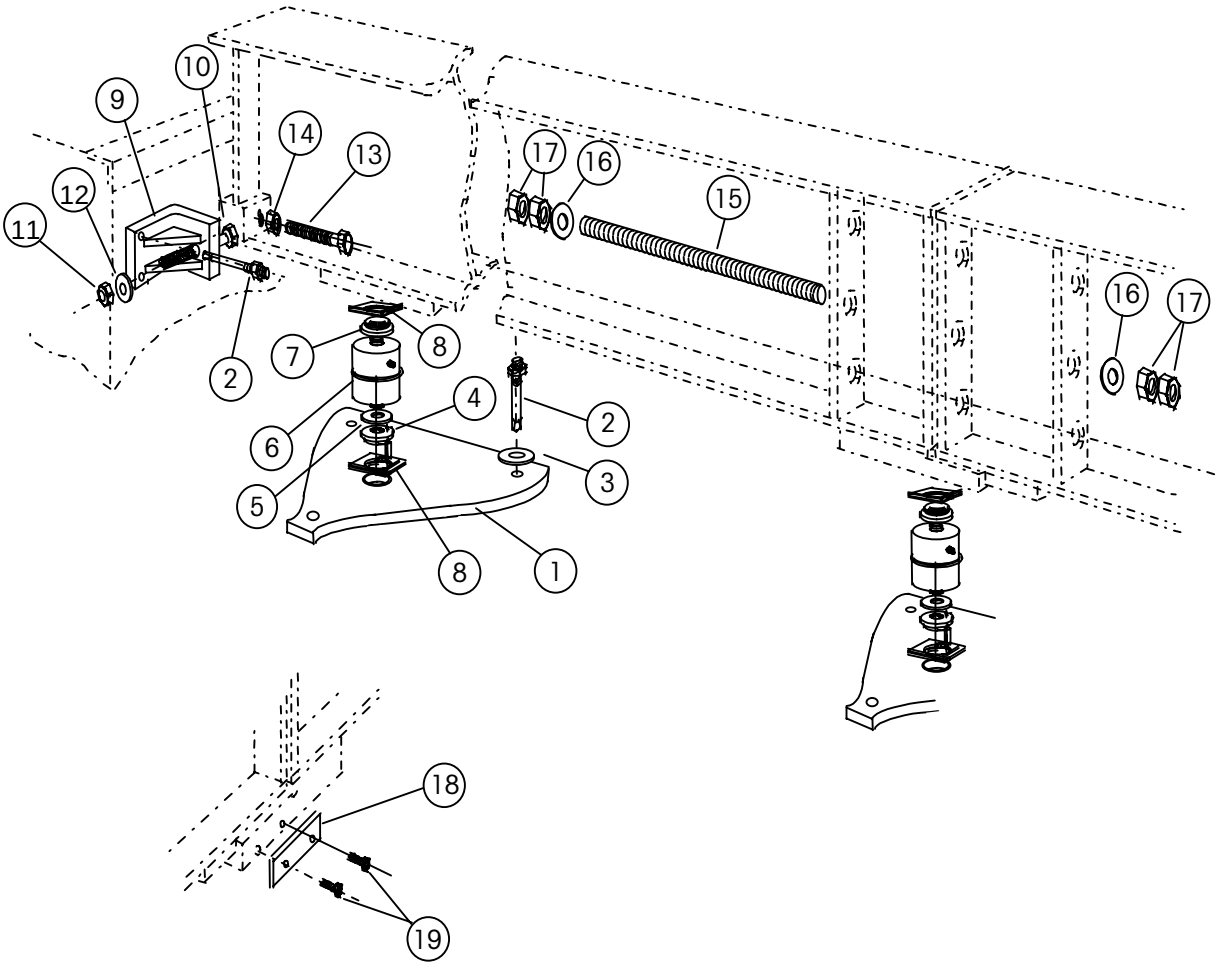
When air temperature during placement is less than 40°F, or will be within 24 hours, temperature of concrete as placed is to be between 50°F and 90°F (55°F and 90°F for a section less than 12 inches thick). Maintain concrete temperature within these limits for the full curing period of 7 days.

Slab areas may be either moist-cured or receive an application of curing compound, except that when concrete above grade is placed in the open, and the air temperature exceeds 75°F, the concrete is to be moist-cured for the first 24 hours.

Whichever curing method is used, it shall begin immediately after the water sheen disappears and continue for at least 7 days. Do not allow curing to be delayed overnight.

9 Service Parts

Refer to Figure 9-1 and Table 9-1 when ordering parts for Model 7531 truck scales. Table 9-2 lists reference drawings for installing the scales.



Coupler Side Shimming

Figure 9-1: Parts for Model 7531 Truck Scales

Ref No.	Part Number	Description
1	TA203619	Base Plate (w/ MZ0904000063 Roll Pin)
2	TN203216	3/4-10 Anchor Bolt x 5 1/2 inches long
3	MZ0901030111	3/4-inch Plain Washer, Zinc Plated
4	TA200814	Lower Hexagonal Receiver
5	TN203173	Gasket
6	14002500A	22.5 t DigiTOL Load Cell (CMOS)
7	TA200764	Upper Receiver
8	TA200712-1 TA200712-2 TA200712-3	Receiver Shim, 1/8 inch Receiver Shim, 1/16 inch Receiver Shim, 3/16 inch
9	TA203669	Side Bumper Bracket
10	MZ0901010506	5/8-11 Bolt x 1 3/4 inches long, A325
11	MZ0901020066	5/8-11 Nut, Gr. 8
12	MZ0901030062	5/8-inch Flat Washer, F436
Not Shown	TA200357-1 TA200357-2 TA200357-3	Slotted Shim, 1/8 inch (for side bumper) Slotted Shim, 1/16 inch (for side bumper) Slotted Shim, 1/32 inch (for side bumper)
13	TA201606	End Bumper Bolt, 1 1/2-6 x 10 inches long, Gr. 8
14	MZ0901020064	1 1/2-6 Jam Nut
15	MZ0901050006	Tie Rod, 1 1/4-7 x 2 feet long
16	MZ0901030015	1 1/4-inch Washer
17	MZ0901020068	1 1/4-7 Nut
18	TA200801-1 TA200801-2 TA200801-3	Coupler Side Shims, 1/4 inch Coupler Side Shims, 1/8 inch Coupler Side Shims, 1/16 inch
19	MZ0901010356	10-32 Screw x 1/2-inch long
Not Shown	MZ0901010505	1-8 Bolt x 3 inches long (for cross beams)
Not Shown	MZ0901020062	1-8 Nut (for cross beams)
Not Shown	MZ0901030109	1-inch Washer, F436 (for cross beams)
Not Shown	TN203217	Magnalube-G Lubricant
Not Shown	TA200831	Locating Tool

Table 9-1: Parts for Model 7531 Truck Scales

Reference Drawings

Size	Foundation	General Layout	Wiring Diagram CMOS Standard	Wiring Diagram CMOS Hazardous
10 x 10	TC203898	TC203904		
10 x 11	TC203901	TC203907		
12 x 10	TC203899	TC203905		
12 x 11	TC203902	TC203908		
20 x 10	TC203636	TC203653		
20 x 11	TC203643	TC203660		
25 x 10	TC203637	TC203654	TC100460	TC100442
25 x 11	TC203644	TC203661		
40 x 10	TC203638	TC203655		
40 x 11	TC203675	TC203662		
50 x 10	TC203639	TC203656		
50 x 11	TC203646	TC203663		
60 x 10	TC203640	TC203657		
60 x 11	TC203647	TC203664		
70 x 10	TC203641	TC203658		
70 x 11	TC203638	TC203665		
80 x 10	TC203642	TC203659		
80 x 11	TC203649	TC203666	Reference:	Reference:
90 x 10	TC203900	TC203906	TB100495 Wiring	TB100496 Wiring
90 x 11	TC203903	TC203909		

Table 9-2: Reference Drawings for Model 7531 Truck Scales

METTLER TOLEDO

Publication Suggestion Report

If you have suggestions concerning this publication, please complete this form and fax it to (614) 841-7295

Publication Name: METTLER TOLEDO 7531 DigiTOL TRUCKMASTER Installation and Service Manual

Publication Part Number: 15872700A **Publication Date: 1/00**

PROBLEM(S) TYPE:	DESCRIBE PROBLEM(S):	*INTERNAL USE ONLY*
☐ **Technical Accuracy**	☐ Text ☐ Illustration	
☐ **Completeness** What information is missing?	☐ Procedure/step ☐ Illustration ☐ Definition ☐ Example ☐ Guideline ☐ Feature ☐ Explanation ☐ Other (please explain below)	☐ *Info. in manual* ☐ *Info. not in manual*
☐ **Clarity** What is not clear?		
☐ **Sequence** What is not in the right order?		
☐ **Other Comments** Use another sheet for additional comments.		

Your Name: _____ **Location:** _____

Phone Number: ( ) _____

Fax this completed form to METTLER TOLEDO at (614) 841-7295

METTLER TOLEDO
1900 Polaris Parkway
Columbus, Ohio 43240 USA

P/N: 15872700A

(1/00).00

15872700A