4182

Technical Manual
and
Parts Catalog

INTRODUCTION

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

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

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

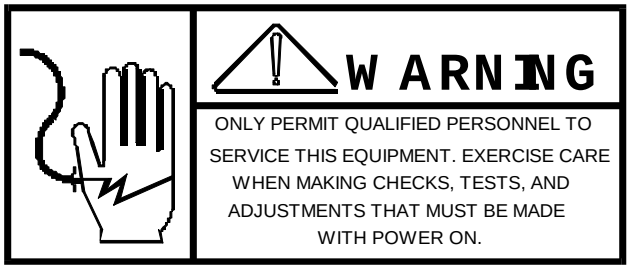
METTLER TOLEDO RESERVES THE RIGHT TO MAKE REFINEMENTS OR CHANGES WITHOUT NOTICE.

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.

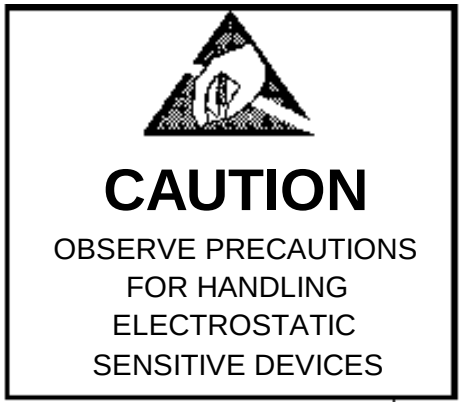
- **ALWAYS** take proper precautions when handling static sensitive devices.



- **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

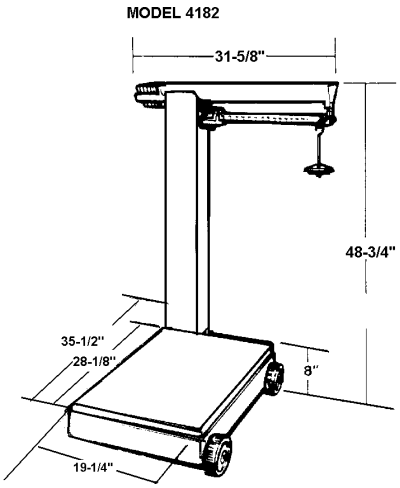
1. DESCRIPTION

The Toledo Model 4182 is a compact industrial scale designed to meet a variety of weighing needs where simplicity and low cost are a must.

The 4182 features an easy to read flat beam with a shadow-proof poise providing quick reading under all lighting conditions. A positive beam lock secures the indicator when the scale is not in use.

This scale utilizes a rugged fabricated steel design and is equipped with phenolic wheels for easy portability. an accessory pan is available to tailor the scale to a specific application.

2. SPECIFICATIONS



Available Beams	Counterpoise Weights (Included)	Total Capacity
100 lb x 8 oz	2 of 100 lb 1 of 200 lb 1 of 500 lb	1000 lb
50 kg x 200 g	1 of 50 kg 2 of 100 kg 2 of 100 kg 1 of 200 kg	500 kg

Combination beam: avoirdupois (front) and metric (back): includes both sets of counterpoise weights as listed above.

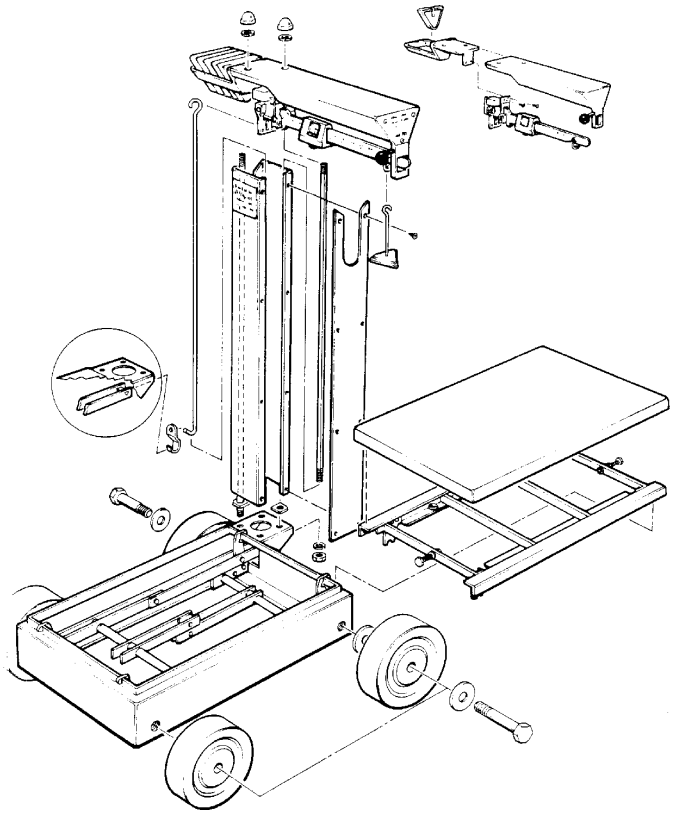


FIGURE 1

3. Assembly/Installation

(NOTE: Refer to the exploded view diagram, Figure 1, for assembly assistance.)

1. 4182 CARTON ITEMS

1. One scale base (plastic wrapped)
2. One fog white column (bubble packed) consisting of one three-sided column piece and one one-sided column piece.
3. One charcoal black beam shelf (bubble packed).
4. One carton containing two threaded column rods and one steelyard rod.
5. One box containing one silver-colored graduated beam. This box is packed inside of the fog white column (item 2).
6. One box of loose parts containing (in order of assembly):

    a. Four wheels
    b. Four 1/2" axle bolts, each with one 3/8" nut, one lock washer, and two flat washers
    c. Two rectangular column plates (1" by 1/2" with a beveled corner)
    d. Two lock washers
    e. Two 3/8" nuts
    f. One black column cap (with rack for counterpoise weights)
    g. Two flat washers
    h. Two 3/8" acorn nuts
    I. One hook
    j. Ten Phillips screws
    k. One triangular load box assembly
    l. One set of counterpoise weights as described in Section II of this manual (two sets of weights on combination lb/kg versions)

2. TOOLS FOR EASY ASSEMBLY

a. 3/4" socket and ratchet
b. 3/4" open end wrench
c. 9/16" open end wrench
d. 9/16" deep socket and ratchet
e. #2 Phillips screwdriver
f. 1/4" slotted screwdriver

3. STEPS FOR ASSEMBLING OF 4182

1. Remove the plastic wrapping from the scale base.

2. Remove the scale platform from the scale base and set it aside.

3. For reinstallation purposes, note the location of the level bubble on the spider assembly. Also note the position of the two bolts in the center front and center back of the spider assembly. Lift out the spider assembly and place it off to the side.

4. Remove any cardboard packing and the bag of silica gel from inside of the scale base.

5. Install each wheel in the following sequence:
    a. Slide one flat washer onto the 1/2" axle bolt and slide the bolt through the black phenolic wheel.

    b. Slide another flat washer onto the bolt.

c. Lifting the scale base the required distance (approximately 2-1/2”), insert the bolt through the hole in the scale base from the outside and screw the bolt through the nut that is welded to the inside of the scale base.

d. From inside of the scale base, add the lock washer and nut onto the bolt.

e. Repeat these steps for the remaining three wheels.

f. Tighten all bolts and nuts for the wheels at this time.

6. To install the two threaded column rods, screw the two rectangular column plates onto the rods approximately 1”. Note that the column rods will be mounted into the small lower left and upper right holes of the column support plate (when standing in front of the short side of the scale platform). See Figure 2. Insert each column rod through the proper hole in the support plate, being sure that the column plates do not cover any part of the large center hole in the support plate, being sure that the column plates do not cover any part of the large center hole in the column support plate. Also, be sure that the beveled edges of the rectangular column plates are the furthest distance away from the large center hole in the column support plate as possible. This will allow proper alignment of the column itself. See Figure 3. From underneath the column support plate, install a lock washer and 3/8” nut onto the column rod. These nuts should be finger-tightened only.

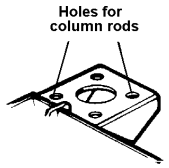


Figure 2

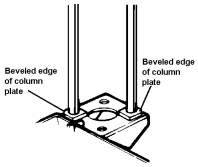


Figure 3

7. Remove the packing around the fog white column. Place the three-sided column piece on the column support plate. The Attention Operator decal on the column must be facing the scale platform. Be sure that the two column support plates are butted up against the inside corners of the column. The one-sided column piece will be added later.

8. To attach the silver-colored beam assembly to the black column cap, align the two holes in the plate of the beam assembly with the two small holes in the notched area under the top of the column cap. Insert and tighten two Phillips screws. See Figure 4.

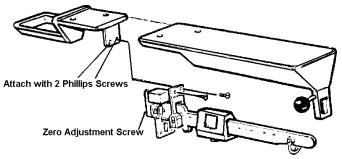
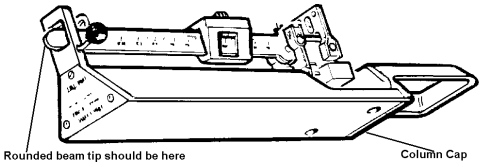


Figure 4

9. Place the black beam shelf upside down on the scale platform. NOTE: Place some type of protection (i.e., cardboard) on the scale platform to protect the platform from getting scratched.

10. Turn the beam assembly upside down also. Insert the rounded tip of the beam through the trig opening end of the beam shelf (under the data plate). On the opposite side, slide the top of the beam shelf over the column cap and align the holes in the beam shelf with those in the column cap. See Figure 5.



11. Lift the assembled beam, turn it over, and position the cap over the column and column rods. Insert the two column rods through the two holes in the column cap. Place a washer and a 3/8" acorn nut on each rod and tighten so as not to allow any vertical movement of the beam assembly. See Figure 1. NOTE: BE SURE THAT THE ROUNDED BEAM TIP IS CENTERED IN THE TRIG OPENING (FRONT TO BACK) BEFORE TIGHTENING.

12. Place the hook onto either end of the steelyard rod.

13. Insert the steelyard rod into the column through the open side of the column with the hook end down. Attach the top of the steelyard rod through the stirrup on the beam assembly.

14. Reach into the column from the open side and connect the hook that is on the steelyard rod under the pivot at the end of the main lever of the scale base. Raising the tip of the main lever and some slight twisting of the hook, by hand, may be required to get the hook under the pivot.

15. On the scale base, be sure that the four gold-colored fulcrum assemblies on the lever system are properly hooked into the slots on the base flange.

16. Reinstall the spider assembly that was removed in step 3. Tilt the front end of the spider assembly, closest to the column, downward slightly for ease of reinstallation. The L-shaped bracket located in the center-front of the spider assembly must be under the base flange; the heads of the two hex head bolts located in the center-front and center-back of the spider must both be inside of the base flange. Once installed, be sure that the four bearings are properly seated on the four pivots of the main lever system.

17. Reinstall the scale platform removed in step 2.

18. Using eight Phillips screws, attach the one-sided column piece to the three-sided column piece.

19. Hook the load box assembly onto the stirrup located at the rounded end of the beam assembly, just inside of the trig opening.

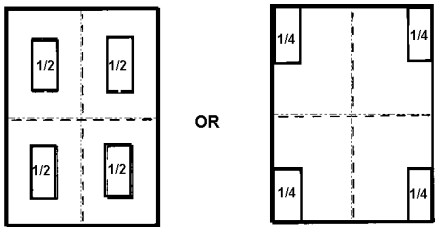
20. Place the counterpoise weights in the rack attached to the column cap.

21. Adjust the scale to zero, if necessary. See Section V of this manual.

4. SHIFT

1. TEST

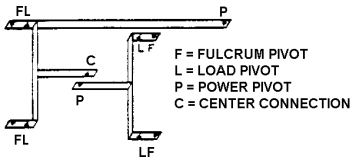
Place a half capacity test load at the center of each quarter of the platform or use a quarter capacity test load over each load pivot successively.



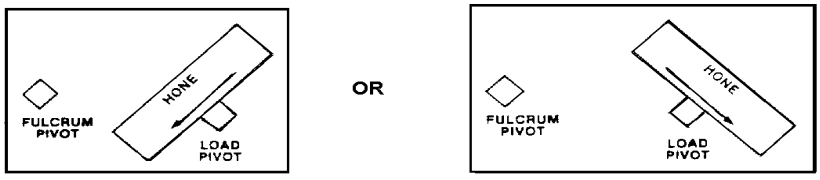
If a correction is not needed, proceed to the operating instructions. In a mechanical base, shift refers to the pivot distances of the levers. If on a lever the distances are equal, then a lever is said to have no shift error. Also, two levers which have the same ratio will have no shift error.

2. ADJUST

The lever illustration of the 4182 designates the pivots as follows:



The rule is to lengthen the distance between the fulcrum and the load pivots to increase the indication. Conversely, shorten the distance between the fulcrum and the load pivots to decrease the indication. Use hone part number 085061020 (fine) and part number 085062020 (coarse) to adjust the pivots.



TO LENGTHEN THE DISTANCE

TO SHORTEN THE DISTANCE

Note the direction of honing. Always hone away from the load edge of the pivot.

1. Side to Side

   To correct a shift error side on a lever, note the indication at each location and hone the load pivot as needed to correct the side to side error on either lever. Hone only the load pivots to correct an error on either lever for a side to side correction.

2. Front to Back

When the indications on each load point of each lever are equal side to side and the indications of the levers are different front to back, then hone the power pivot of the short lever until the two levers are equal front to back. Do not hone the power pivot of the long lever. Increase the pivot distance from the power pivot to the fulcrum pivot on the short lever if the short lever has a higher indication than the long lever.

When the shift error is corrected, recalibrate the scale and retest the shift. Continue calibration and shift test/adjustment until no shift error is found after the scale is calibrated.

5. ZERO ADJUSTMENT

Check the zero balance by positioning the beam poise at "0" on the beam. Turn the locking lever to free the beam. The beam should float without touching the top or the bottom of the trig opening. If it touched the top, turn the zero adjustment screw (Figure 4) counter-clockwise with a screwdriver. Turn the screw clockwise if it is touching the bottom.

6. OPERATING INSTRUCTIONS

1. SCALE OPERATION

The Toledo Model 4182 beam scale utilizes a balancing beam principle to indicate weight. With the scale loaded, slide the beam poise toward the trig loop (away from the column). Adjust the beam poise until the tip of the beam is in a balanced state within the trig loop. The position of the beam poise indication (red pointer) on the beam will indicate the amount of weight on the scale platform.

NOTE: When operating the scale, use wedges at the wheels to prevent the scale from moving.

2. INCREASING SCALE CAPACITY

The beam on the 4182 provides weight indication up to 100 lb (50 kilogram) and is graduated by 8 ounces (200 gram). The beam will counter balance a maximum load of 100 lb (or 50 kilogram). To increase the capacity of the scale, simply place one or more of the additional counterpoise weights on the load box assembly. (For example, the avoirdupois 4182 includes four additional counterpoise weights, which are (2) 100 lb, (1) 200 lb, and (1) 500 lb. The additional counterpoise weights are stored in a rack attached to the column cap. Each weight is "notched" to fit the load box assembly. Counterpoise weights may be used separately or in combination. When using one or more of the additional counterpoise weights to determine weight on the platform, adjust the beam poise until a balance state is achieved. The weight on the platform can be determined by adding the sum of the additional counterpoise weights on the load box assembly to the amount indicated on the beam.

Example: Both additional 100 lb counterpoise weights are secured to the load box assembly. The beam poise is indicating "45 lb", and the beam is balanced in the trig loop; weight on the scale platform total 245 lbs.

3. FILLING OPERATIONS

When filling containers on the scale, adjust the beam poise to the desired target weight. Add additional counterpoise weights to the load box assembly if necessary.

A set screw is provided on the bottom of the beam poise to secure it to the beam. To inhibit the beam poise from traveling on the beam (and changing the target weight), it is advisable to tighten the set screw. Fill the container until the beam exhibits a balanced condition indicating that the target weight has been achieved.

4. TRIG LOCKING MECHANISM

When moving the scale, it is recommended that the beam be locked in place to prevent damage. A locking mechanism is provided on the trig loop to inhibit vertical travel of the beam whenever the base is moved. The trig loop locking device must be disengaged when the scale is in use.