



**Summary of Substantive Changes  
between the 2017 and the 2011 edition including Update No. 1 dated May 2012 of  
CSA B45.5/IAPMO Z124, “Plastic plumbing fixtures”**

**Presented to the IAPMO Standards Review Committee on April 10, 2017**

**General:** The changes to this standard may have an impact on currently listed products. The substantive changes are:

- Added new definition for a concealed tank and clarified the definitions of critical support area, grab bars, grip rails, and fixtures of flexible soft construction (see Section 3)
- Clarified the requirements for fixtures of flexible soft construction (see Sections 3 and 5.25)
- Changed the requirement for overflows in bathtubs from a mandatory specification to an option of the manufacturer and clarified the dimensional requirements (see Section 4.2.2 and Figure 7).
- Increased the spacing between the finished wall and the grab bar from 25 mm (1 in) to 38 mm (1.5 in) (see Section 4.4 and Figure 18)
- Added additional tests for water closet tanks including inlet connection and hydrostatic load test which were previously required in IAPMO Z124.4-2006 but were removed in the first edition of the harmonized standard, CSA B45.5-11/IAPMO Z124-2011 (see Sections 4.5, 5.26, 5.27 and Figures 19 and 20)
- Clarified the performance requirements and the orientation of grab bars, and limited the application of the load test to grab bars and the rotation test to grip rails (see Section 5.2 and Figures 1 and 2)
- Revised the waste fitting connection test procedure to specify that examination shall take place while the load is in place (see Section 5.6)
- Added requirements for non-instrumented and instrumented evaluation and clarified the test procedure and performance requirements (see Section 5.10)
- Removed the requirement to apply the “N” mark to indicate products with non-standard dimensions (see Section 6.2)

Section 3, Definitions: Added a definition for concealed tank and clarified the definitions of critical support area, grab bars, and grip rails as follows:

*Concealed tank — a water closet tank intended to be installed behind a wall.*

*Critical support area — that portion of the back, service, or non-service vertical wall located between 600 and 1200 mm (24 and 48 in) above the finished surface of the fixture floor in which grab bars provide the most beneficial support in the bathing area.*

*Note: The critical support area is that portion of the back, service, or non-service vertical wall in which grab bars provide the most beneficial support in the bathing area located between 600 and 1200 mm (24 and 48 in) above the finished floor surface of the fixture.*

*Flexible ~~core~~(soft) construction — a combination of materials comprising a flexible-compressible centre faced on the bathing surface with a pliable, non-rigid top layer and a base layer made of rigid both sides with other materials.*



Grab bar — a ~~bar rod~~ or similar device ~~that integrated with~~ (a) is installed in a fixture, ;  
(b) is located wholly or partially in the critical support area, ;  
(c) meets the applicable dimensional requirements of this Standard; and  
~~(a)(d)and is~~ designed to bear the loads specified in this Standard~~be grasped by the hand for the purpose of assisting a person entering, leaving, or moving around the bathing area.~~

Grip rail — a bar, handle, or similar device  
(a) integrated with a bathtub; and fixture,  
~~(a)(b) not located in the critical support area but~~ located on the rim or below the rim within the bathtub  
~~but not located wholly or partially in the critical support area~~compartment area, and designed to be  
~~grasped by the hand for the purpose of assisting a person entering, leaving, changing from a sitting to a~~  
~~standing position, or moving around within a bathtub.~~

Section 4.2.2, Overflows: Changed the requirement for overflows in bathtubs from a mandatory specification to an option of the manufacturer as follows:

#### 4.2.2 Overflows ~~(for lavatories and sinks only)~~

##### 4.2.2.1 ~~Provision and positioning~~ Lavatories and Sinks

###### 4.2.2.1.1

Overflows in lavatories and sinks may be provided at the option of the manufacturer. When overflows are provided, their position in the fixture shall be at the option of the manufacturer and shall comply with the performance requirements in Clause 5.19.

###### ~~4.2.2.24.2.2.1.2~~ Overflows in sinks intended for food preparation

~~When provided, overflows in sinks intended for~~ dishwashing and food preparation (e.g., kitchen and bar sinks) shall not be concealed and shall be accessible for disassembly and cleaning after installation.

###### ~~4.2.2.3~~ Performance

~~When provided, overflows shall comply with Clause 5.19.~~

##### 4.2.2.2 Bathtubs

Overflows in bathtubs may be provided at the option of the manufacturer. When overflows are provided, their dimension, location, and position in relation to the waste outlet in the fixture shall be as shown in Figure 7.

Variations in location, geometry, diameter, and angle of orientation of the overflow opening shall be acceptable when factory-provided waste and overflow fittings are used.

Note: Local plumbing codes might require bathtub overflows.

##### ~~4.4.3~~ Minimum dimensions for bathtubs

~~The minimum dimensions for bathtubs shall be as shown in Figure 7.~~

~~Variations in location, geometry, diameter, and angle of orientation of the overflow opening shall be acceptable when factory-provided waste and overflow fittings are used.~~



Section 4.4, Bathtubs and shower bases: Increased the spacing between the finished wall and the grab bar from 25 mm (1 in) to 38 mm (1.5 in) and added figures 18(a) and 18(b) for clarity as follows:

#### ~~4.4.3 Minimum dimensions for bathtubs~~

~~The minimum dimensions for bathtubs shall be as shown in Figure 7.~~

~~Variations in location, geometry, diameter, and angle of orientation of the overflow opening shall be acceptable when factory-provided waste and overflow fittings are used.~~

#### 4.4.5.4.4 Diameter, spacing, and grippable length of grab bars

Grab bars intended for residential and commercial installations shall have a

(a) diameter of between 22 and 40 mm (~~0.866~~0.9 and ~~1.575~~1.6 in) or an equivalent cross-sectional area;

(b) spacing of ~~at least 25~~38 mm (1.5 in) between the finished wall and the inside grippable surface of the grab bar; and

(c) minimum grippable length of

(i) 228 mm (9.0 in), ~~centred over the span of the bar~~ for bars mounted horizontally (see Figure 18(a)); and

(ii) 152 mm (6.0 in), for bars mounted vertically (see Figure 18(b)).

Section 4.5, Water Closets: Added additional tests for water closet tanks that were previously included in IAPMO Z124.4-2006 but were removed in the first edition of the harmonized standard CSA B45.5-11/IAPMO Z124-2011 as follows:

#### 4.5.1 General

In addition to the applicable requirements in this standard, water closets and their flushing devices shall comply with the applicable requirements of ASME A112.19.2/CSA B45.1, except that the structural integrity tests for floor-mounted water closets shall be conducted in accordance with Clause 5.8.8.

#### 4.5.2 Concealed Tanks

Concealed tanks shall be required to comply only with the following tests:

(a) radii load test (Clause 5.9);

(b) water absorption test (Clause 5.25.4);

(c) inlet connection test (Clause 5.26); and

(d) hydrostatic load test (Clause 5.27).

Section 5.2, Stress tests for grab bars and grip rails: Clarified the performance requirements and the orientation of grab bars, and limited the application of the load test to grab bars and the rotation test to grip rails as follows:

#### 5.2.1 Load ~~and rotation~~ tests for grab bars ~~and grip rails~~

##### 5.2.1.1 Procedures

##### 5.2.1.1.1 Load test for grab bars

The load test for grab bars shall be conducted as follows:

(a) For horizontally mounted bars, apply the load vertically downward. For vertically mounted bars, apply the load pulling downward at an angle of  $30 \pm 5^\circ$  from the wall.

(b)(a) Over a period of 30 s, gradually apply a load of 1.3 kN (292 lbf) on the middle 90 mm (3.5 in)



section of the specimen, as follows:

(i) vertically downward, for grab bars mounted horizontally (i.e., grab bars installed at 45° or less from the horizontal); and

(ii) pulling downward at an angle of 30 ± 5° from the wall, for grab bars mounted vertically (i.e., grab bars installed at more than 45° from the horizontal).

~~(e)~~(b) Hold the load for 5 min ± 10 s.

(c) Following removal of the load, subject the specimen to a water leakage test in accordance with Clause 5.18(c), except that the water spray shall be

(i) aimed at the points where the specimen is mounted; and

(ii) applied for 30 min after the test load is removed.

#### 5.2.1.2 Performance

Grab bars shall not break or detach from the fixture. In addition,

(a) there shall be no leakage between the grab bar and the fixture, and

\*~~(b)~~ the fixture shall not show signs of cracking or other defects when inspected in accordance with Clause 5.4.1(d); and

(c) with the load removed, the grab bar shall not rotate within the fixture.

#### 5.2.1.2 Rotation test for ~~grab bars and~~ grip rails

##### 5.2.2.1 Procedure

The rotation test for ~~grab bars and~~ grip rails that rotate within the fixture shall be conducted as follows:

(a) Rotate the specimen along its long axis ~~grab bar or the grip rail~~ to a fixed position by applying a torque of not more than 5 N-m (44 lbf-in).

(b) Mark the surface of the specimen ~~grab bar or the grip rail~~ with a fine-tip marker.

(c) Locate a reference indicator at the mark.

(d) Rotate the specimen along its long axis ~~grab bar or grip rail~~ to the maximum distance in the opposite direction from the reference indicator by applying a torque of not more than 5 N-m (44 lbf-in).

(e) Measure the angle of the rotation.

(f) Following removal of the load, subject the specimen to a water leakage test in accordance with Clause 5.18(c), except that the water spray shall be

(i) aimed at the points where the specimen is mounted; and

(ii) applied for 30 min after the test load is removed.

##### 5.2.2.2-3 Performance

Grip rails shall not rotate more than 22.5° or detach from the fixture. In addition,

(a) there shall be no leakage between the grip rails and the fixture, and

(b) the fixture shall not show signs of cracks or other defects when inspected in accordance with Clause 5.4.1(d).

#### 5.2.2 Water leakage test for ~~grab bars and~~ grip rails

~~Following the load and rotation tests for grab bars and the rotation test for grip rails, the specimen shall be subjected to a water leakage test in accordance with Clause 5.18(c), except that the water spray shall be aimed at the points where the grab bar or grip rail is mounted for 30 min after the test load is removed.~~



### 5.2.3 Performance

#### 5.2.3.1

~~Grab bars, grip rails, or any accessory within the bathtub enclosure, shower base, or tub/shower fixture combination that projects more than 25 mm (1 in) and can be grasped, whether located within or outside the critical support area (e.g., a towel bar), shall not~~

~~(a) break when tested in accordance with Clause 5.2.1.1;~~

~~(b) rotate more than 22.5° when tested in accordance with Clause 5.2.1.2; and~~

~~(c) allow water leakage at the points where the grab bar or grip rail is mounted when tested in accordance with Clause 5.2.2.~~

#### 5.2.3.2

~~In addition, the bathtub enclosure or shower base, or tub/shower fixture combination, shall not show signs of cracks or other defects when inspected in accordance with Clause 5.4.1(d).~~

Section 5.6, Waste fitting connection test: Revised the waste fitting connection test procedure to specify that examination shall take place while the load is in place as follows:

#### 5.6.1 Procedure for bathtubs and shower bases

The waste fitting connection test for bathtubs and shower bases shall be conducted as follows:

(a) Wash the specimen with a solution of standard liquid detergent and water, rinse with water, and dry.

(b) Apply a  $220 \pm 4$  N ( $50 \pm 1$  lbf) load using a  $610 \pm 6$  mm ( $24 \pm 0.25$  in) lever arm connected to the waste fitting and extending horizontally as shown in Figure 9.

(c) Ensure that the load application does not exceed the test parameter by gradually applying the load over 5 to 10 s. Any combination of weight and lever arm may be used in lieu of the weight and lever arm specified in Item (b) as long as the bending moment is 136 N-m (100 ft-lb).

(d) Apply the load and examine for cracks with load in place.

~~(d)(e)~~ Apply the load ~~for 1 min~~ in two additional radial locations which shall be approximately 180° apart. Examine for cracks with load in place. ~~Two of the three locations shall be approximately 180° apart.~~

~~(e) Examine the specimen in accordance with Items (b) to (d) of Clause 5.4.1.~~

Section 5.10, Colourfastness test: Added requirements for non-instrumented and instrumented evaluation and clarified the test procedure and performance requirements as follows:

#### 5.10.1 Specimen

The specimen shall comprise two piecesamples taken from the same area of the plastic plumbing fixture. One piecesample (the test piecesample) shall be tested for 200 h in accordance with ASTM D2565. The other piece (the control piecesample) shall be stored away from any light source at a temperature of  $23 \pm 5$  °C ( $73 \pm 9$ °F).



### 5.10.2 Conditions

The conditions for the colourfastness test shall be as follows:

- (a) The black panel temperature shall be maintained at  $63 \pm 5$  °C ( $145 \pm 9$ °F).
- (b) Humidity need not be controlled.
- (c) The irradiance of the xenon arc lightbulb shall be maintained at  $0.35 \pm 0.02$  W/m<sup>2</sup> at 340 nm for the duration of the test.
- (d) The light filters surrounding the xenon arc lightbulb shall be borosilicate glass.

### 5.10.3 Procedure

#### 5.10.3.1 Exposure procedures

~~The colourfastness test shall be conducted as follows:~~ The test sample shall be subjected to the following exposure procedures:

- ~~(a) Take colour readings on the test piece with the reading instrument set to read at an illumination of D65, a CIE 10° observer with the specular component excluded, and using the CIELAB colour scale.~~
- ~~(b)~~(a) Subject the test piece to the light source sample to conditions specified in Clause 5.10.2~~(c)~~ for 200 h in accordance with ASTM D2565.
- ~~(c)~~(b) At the conclusion of the 200 h test period, store the test piece sample away from any light source at a temperature of  $23 \pm 5$  °C ( $73 \pm 9$ °F) for not less than 72 h.
- ~~(d)~~(c) Take final colour readings for determining colour change after the 72 h period as specified in Item
- ~~(e)~~ Clause 5.10.3.2 shall be used to evaluate the colourfastness. Clause 5.10.3.3 shall be used if the results of Clause 5.10.3.2 are uncertain.

#### 5.10.3.2 Non-instrumented evaluation

Non-instrumented evaluation shall be conducted as follows:

- a) The test sample shall be examined with the unaided eye from a distance of between 300 and 610 mm (1 and 2 ft) for significant change in colour or surface texture when compared with the control sample using the light source as specified in Clause 5.4.1(d).
- b) The samples shall be placed next to each other while completing the examination.
- c) The test sample shall comply with the performance requirements in Clause 5.10.4.1.

#### 5.10.3.3 Instrumented evaluation

Instrumented evaluation shall be conducted as follows:

- a) Colour readings shall be taken on the test sample before and after accelerated aging with the reading instrument set to read at an illumination of D65, a CIE 10° observer with the specular component excluded, and using the CIELAB colour scale. The location on the sample where the readings are taken, as well as the orientation of the sample in relation to the reading instrument, shall be noted. The same sample location and orientation shall be used for both measurements.
- b) A minimum of three delta E readings shall be taken and averaged.
- c) The test sample shall comply with the performance requirements in Clause 5.10.4.2.

### 5.10.4 Performance

~~When compared with the control piece, the test piece shall show no significant change in colour. The average colour difference between the test and control pieces shall be not more than  $\pm 2$  Delta E units. Discolouration that can be removed by abrading the surface to a maximum depth of 0.125 mm (0.005 in) and repolishing in accordance with the manufacturer's care and maintenance instructions shall be acceptable. If the specimen fails, to pass the test two more specimens shall be tested and both shall pass.~~



#### 5.10.4.1 Non-instrumented performance

The following shall apply for non-instrumented performance:

- a) There shall be no significant change in colour and surface texture between the test and control samples. A significant change in colour shall be defined as an observable colour difference when the samples are placed next to each other and examined using the conditions specified in Clause 5.10.3.2(a).
- b) If the sample fails to pass the test, two more samples shall be tested and both shall pass.

#### 5.10.4.2 Instrumented performance

The following shall apply for instrumented performance:

- a) The average colour difference of the test sample before and after the exposure procedures specified in Clause 5.10.3 shall be not more than 2 delta E units.
- b) If the sample fails to pass the test, two more samples shall be tested and both shall pass.

Section 5.19, Overflow test (lavatories and sinks): Revised the section title to clarify that the overflow test applies to lavatories and sinks as follows:

#### 5.19 Overflow test (lavatories and sinks)

5.25 Tests for flexible (soft) construction fixtures: Revised the section title to clarify that the test applies to flexible core fixtures that have a soft foam core and a flexible vinyl top coat as follows:

#### 5.25 Tests for flexible ~~core~~(soft) construction fixtures

Section 5.26, Inlet Connection Test: Added an inlet connection test for water closet tanks which have the water supply shank below the tank water level as follows:

#### 5.26 Inlet Connection Test

##### 5.26.1 Procedure

The inlet connection test shall be conducted only on water closet tanks which have the water supply shank below the tank water level, as follows:

- (a) Connect a 150 mm (6 in) galvanized nipple with a 9.5 mm (0.375 in) inside diameter to the water inlet shank as illustrated in Figure abc (i.e., the pivot arm).
- (b) Fill the tank with water to the manufacturer's recommended maximum level with water at ambient temperature.
- (c) Apply a load on the pivot arm with a  $6.8 \pm 0.5$  kg ( $15 \pm 1$  lb) mass as illustrated in Figure 18.
- (d) Maintain the load in place for approximately 2 min.
- (e) Inspect the tank for visible damage and leakage while the load is in place.
- (f) Rotate the pivot to two other positions (e.g.,  $120^\circ$  and  $240^\circ$  from the original position).
- (g) Repeat Steps (c) to (e) in each of those positions.
- (h) Remove the load.
- (i) Inspect for damage in accordance with the procedure specified in Clause 5.4.

##### 5.26.2 Performance

- (a) There shall be no visible cracks or water leakage either when the load is in place or after removal of the load.
- (b) There shall be no permanent distortion after removal of the load.



Section 5.27, Hydrostatic Load Test: Added a hydrostatic load test for water closet tanks as follows:

5.27 Hydrostatic Load Test

5.27.1 Procedure

The hydrostatic load test for water closet tanks shall be conducted as follows:

- (a) Install the tank on a matching water closet bowl or suitable test fixture.
- (b) Install deflection gauges on the sides, front, back and bottom of the tank. The side, front, and back gauges shall be positioned 13 mm (0.5 in) below the water level, centered along the tank. The bottom gauges shall be equally spaced. All gauges shall be positioned away from reinforcing ribs, when present. See Figure 19.
- (c) Fill the tank to the manufacturer's recommended maximum level with water at ambient temperature.
- (d) Measure and record the deflections.
- (e) Add the two side deflections, the front and back deflections, and the two bottom deflections.

5.27.2 Performance

The sums of the deflections shall not exceed

- (a) 1.5 mm (0.06 in) for the sides of the tank;
- (b) 4.6 mm (0.18 in) for the front and back of the tank; and
- (c) 1.0 mm (0.04 in) for the bottom of the tank. In addition, each individual deflection shall not exceed 75% of the values specified in Items (a) to (c).

Section 6.2, Non-standard fixtures: Removed the requirement to the apply the "N" mark to indicate products with non-standard dimensions as follows:

~~6.2.2~~

~~Fixtures that do not comply with one or more of the dimensional requirements of this Standard shall be marked with an "N" to indicate the non-standard nature of the fixture.~~

~~Note: This Clause is not intended to apply to fixtures that comply with none of the dimensional requirements of this Standard.~~



Figure 1, Waste outlet dimensions: Added new figure for the dimensions of a laundry sink outlet with integrated drain fitting as follows:

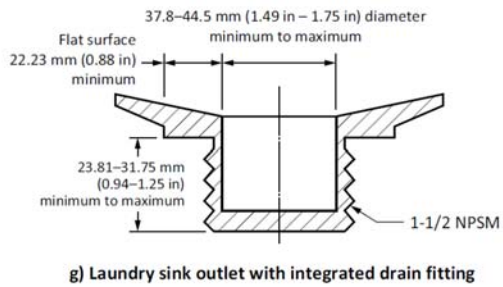
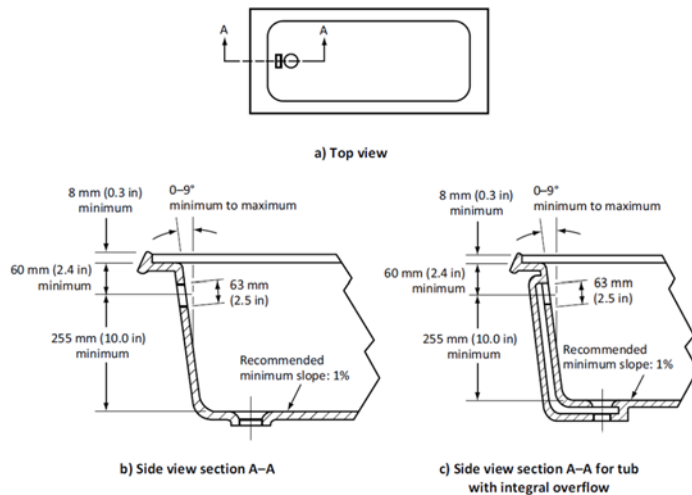


Figure 7, Bathtub overflow: Changed the title of the figure and corrected the leader line to indicate the 255 mm minimum height to the centroid of the overflow is measured from the inside surface of the tub with integral overflow instead of the bottom of the overflow channel, and added the second sentence to the note for clarification as follows:

Figure 7, ~~Minimum dimensions for bathtubs~~ Bathtub overflow



Note: These diagrams are not intended to restrict design. Alternate sizes and shapes shall be considered acceptable.

Figure 18, Grippable length for grab bars: Added figure to clarify requirements for grab bars as follows:

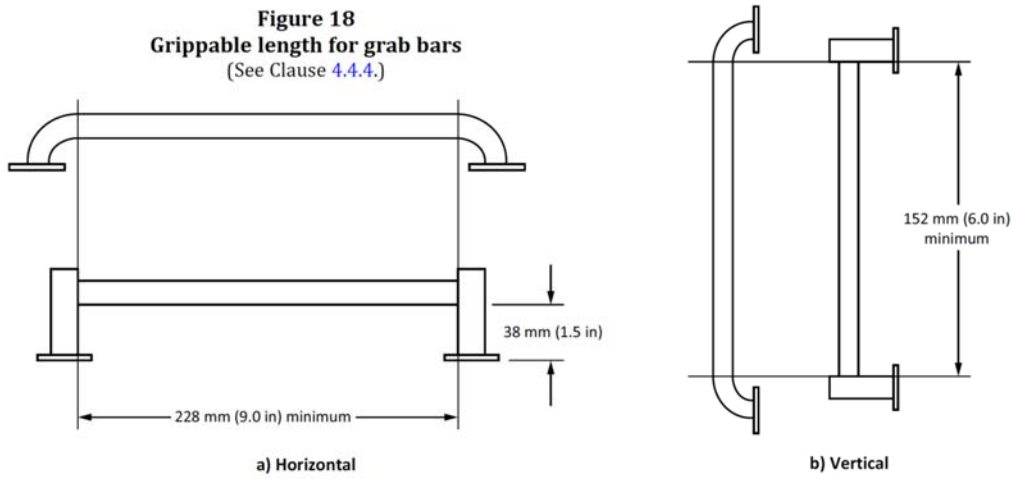


Figure 19, Inlet connection test for water closet tanks: Added a new figure for reference in the inlet connection test:

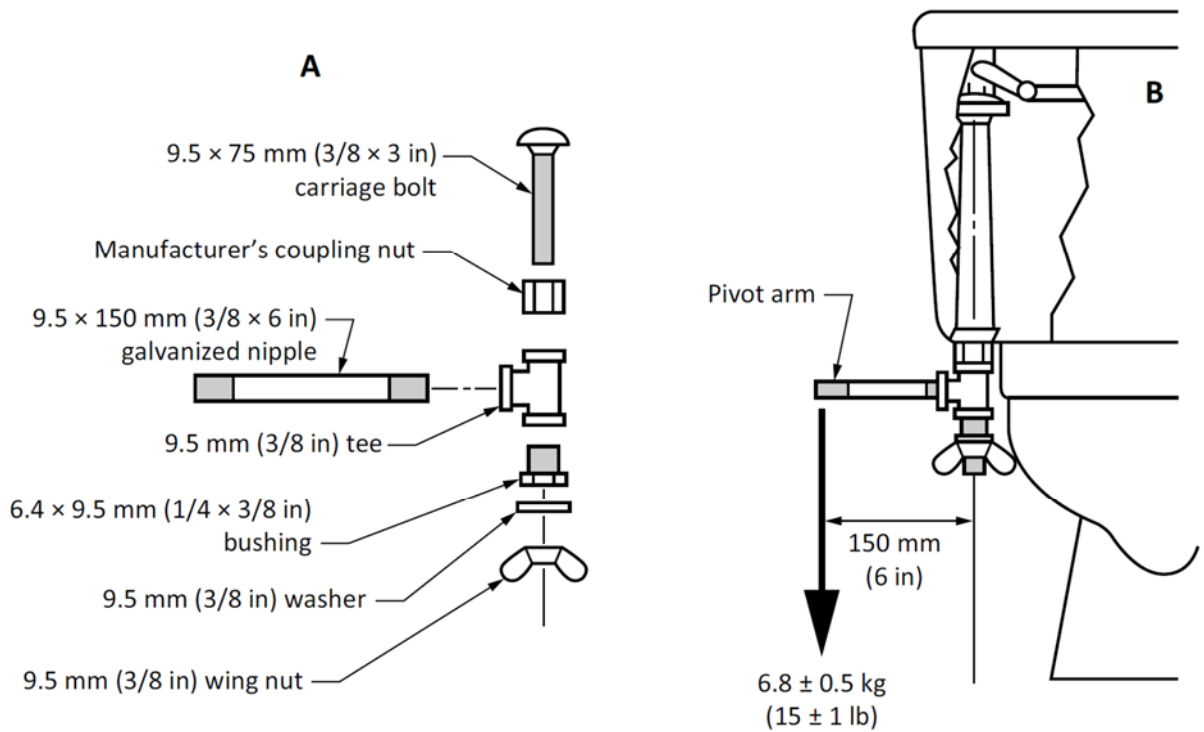


Figure 20, Hydrostatic load test for water closet tanks: Added a new figure for reference in the hydrostatic load test as follows:

