

Inspection and Testing

Portable Weigh Scales



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FOREWARD

Measurement Canada's overall objective is to promote fairness in the marketplace. This task is accomplished by creating a level and fair playing field on which everyone plays by the same rules. Some of the strategies used are to define units of measurements; maintain standards of measurement; approval of trade devices; making and administering regulations which govern the installation, use and performance of trade device; developing specifications for trade devices and finally conducting inspections on trade devices and commodities.

At this time Measurement Canada does not have any set inspection schedule for most trade devices once they have been initially inspected. Initial Inspections are only required when a major component of the scale is replaced such as the Digital Indicator or if the scale is altered in length, width or capacity or if it is upgraded to an "Unattended" scale. Proof of an Initial Inspection shows the most recent time that the scale officially met all of the up to date Measurement Canada requirements for a Legal for Trade scale. Voluntary re-inspection periods are being introduced into various trade sectors at this time. Because there is no specific inspection cycle in place yet, the onus for device accuracy rests solely with the owners.

It is hoped the information contained in this booklet will provide you with sufficient knowledge to conduct a thorough inspection on a contractor's portable scale and to ensure that it is suitable for use in trade (Legal for Trade) and that it weighs and performs correctly. If you require further information on please contact Measurement Canada or an Accredited Service Provider.

This manual has been written for Alberta Transportation by



The manual describes testing procedures used to verify accuracy of Highway construction weigh scales. It does not cover procedures used to adjust calibration of weighing system's components.

April, 2008.

Definitions

"acceptance limits of error" means the limits of error that apply to a device when the performance of the device is tested

(a) at the time the class, type or design of that device is examined for approval,

(b) at the time the device is inspected prior to its first use in trade,

(c) at the time the measuring elements of the device are overhauled or repaired following the failure of the device on inspection to measure within the applicable limits of error, or

(d) at any time within 30 days after the time referred to in paragraph (b) or (c);

"automatic indicating device" means a weighing device in which the position of equilibrium is obtained without an operator's intervention. (ex: electronic indicator)

"Automatic weighing device" means a weighing device that weighs without the intervention of an operator and follows a predetermined program of automatic processes characteristic of the device.

"Canadian unit" means a unit of measurement set out in Schedule II to the Act;

"Initial Inspection" means inspection process carried out prior to weighing device is used in trade

"Indicator" means electronic weight indicator or mechanical weigh beam with appropriate indicating and recording elements in terms of the design, number and size of digits to permit accurate measurement.

"in-service limits of error" means the limits of error that apply to a device when the performance of the device is tested at any time other than a time referred to in the definition of "acceptance limits of error" ;

"inspection mark" means a mark that is made by an inspector after an inspection of a device and that consists of a symbol for the time being in use by inspectors and the date of inspection;

"known test load" means a load consisting of local standards or any other load the weight of which has been determined in relation to local standards;

"Known Test Standards" means certified test weights

"Legal for Trade" means for Use in Trade

"Load receiving element" means weighing platform

"metric unit" means a unit of measurement set out in Schedule I to the Act; (ex: kg)

"non-automatic indicating device" means a weighing device that requires an operator's intervention to obtain equilibrium, such as an equal-arm scale with weights. (ex: mechanical beam)

"Non automatic weighing device" means a weighing device that weighs discrete loads and that requires an operator's intervention during the weighing process, such as to deposit the load to be measured on the weighing and load-receiving element and to remove it there from or to obtain weighing results.

"Portable scale" is movable weighing device

"Primary component" refers to Indicator and Load receiving element

"registration" includes both visual indication and printed representation of quantity, unit price or monetary value

"Suitability" means intention of use with respect to elements of its design, including its maximum capacity, verification scale interval, number of the verification scale intervals, minimum net load that can be weighed and computing capability.

"tank" means a measuring tank for use in trade for measuring the volume of liquid received or delivered, and includes a fixed, portable and vehicle-mounted measuring tank;

Scope of Inspection and Testing

Inspection and Testing Is Performed in 4 Main Steps


- 1). Determine that the scale is a "Legal for Trade Device".
- 2). Visually Inspecting the Equipment, Foundation, Installation etc.
- 3). Test the Device(s) performance and accuracy.
- 4). Complete the Scale Accuracy Inspection Report.

Inspection and Testing Procedures

1). Determine that the scale is "Legal for Trade".

Weights and Measures Act (Section 8) states that any device (weighing device) for **use in trade** must have been approved for its class, type or design and has been inspected by an inspector who has certified that the device meets the requirements of this Act and the regulations. The inspector who inspects the device shall issued Device Inspection Certificate to the owner or person in possession of the device, showing whether the device meets the requirements of this Act and the regulations, mark the device and attach seals, if any to prevent the making of adjustments to the device.

Weights and Measures Inspection Certificate is issued by the recognized technician of an authorized service provider and is used to collect data on device performance and establishment history.

 Measurement Canada / Mesures Canada An Agency of Industry Canada / Un organisme d'Industrie Canada		DEVICE INSPECTION CERTIFICATE	CERTIFICAT D'INSPECTION D'INSTRUMENT	(Certificate No. to a max. of seven digits) (N° de certificat - maximum sept chiffres)								
Issued by / Émis par			Authorized Service Provider	A-999 or/ou								
Address / Adresse, City / Ville, Province			X1X 1X1	R-999								
Telephone No. / N° de téléphone			Fax No. / N° de télécopieur									
Establishment Name - Nom de l'entreprise (1)		Banner - Bannières (2)	District (3)	Zone (4)	Establishment - Code Établissement (11)							
Address - Adresse (5)			Place - Endroit (6)		Province - Province (7)							
Postal Code - Code Postal (8)		Telephone No. - N° de Téléphone (9)	Directions - Coordonnées (10)									
Device - Instrument (12)	Serial Number - N° de série (13)	Capacity / Interval Capacité / Échelon (14)	Approval Number - N° d'approbation (15)	Device - Instrument (16)		Product Code - Code de produit (18)	Inspec. Type Genre d'inspec (19)	As Found Tel que trouvé (20)	Result Résultat (21)	Trade Sector - Secteur commercial (22)	Should be inscribed below/ Doit être inscrit en bas Y-A M (23)	Cert. Lic. No. N° licence cert. (24)
				Type Genre (16)	Sub-type Sous-type (17)							
Device Serial (12)		Date		Comments - Commentaires (26)								

Marking on weighing device:

- The information required by the Regulations to be marked contains:
- . Manufacturer(s)
 - . Model(s)
 - . Distinctive Serial Number(s)
 - . Maximum Capacity
 - . Minimum Graduation Size
 - . Approval Number(s)
 - . Accuracy Class
 - . Year of Inspection
 - . Accredited Organization Number Stamp
 - . The operating temperature range if different than -10°C to +40°C.

The information is clearly marked on a plate or plate(s) (also known as “Data plate”, “Serial plate”) permanently affixed to the device at a place as to be readily legible by a person using the device under normal conditions of use. Major components of complete devices must be marked individually if they can be separated and interfaced (mixed/matched) to other major components to form a device.

PRECISION GIANT SYSTEMS INC.		
EDMONTON • GRANDE PRAIRIE		
	Indicator	Base
MFG.	GSE	PRE
Model	560	E151000
Serial #	132705	951116
Approval #	5419	5018
Max	€3500KG	€3500KG
nmax	20000	g/d 10KG
Temp. Range		Class 1/1H
	Insp. Stamp	A003 2005

Data Plate

Inspection Sticker is a clear indication of verification mark. Do not confuse a calibration sticker with an Inspection Sticker (see sample).



Actual Inspection Sticker (old form)



Actual Inspection Sticker (new form)

2). Inspecting the Equipment, Foundation, Installation etc.

Test Weights

In order to certify portable scales, scale companies are required to have their test weights re-certified annually. Contractors performing scale accuracy tests should use certified weights; however they do not have to be re-certified on an annual basis as long as they are not being used for scale certification purposes. When the weights have been adjusted to weigh correctly they are sealed with a tamper proof lead plug that is stamped with the year that they became valid. The year is marked on the side of the weight with paint and a paper certificate is issued with the serial number of each weight. The paper certificate, intact stamped lead seals, and an inspection for damage or build up of debris is a requirement before a test weight can be used as a ``Certified and Traceable`` test standard.



500 kg Test Weight

Scale House

In the scale house, you will find the indicating element(s) which could be either an electronic indicator or a weigh beam. No matter what type of indicator is used, the operator must have an unobstructed view of the entire scale platform. The scale house provides security and protection from wind, rain etc. Digital indicators and printers must be protected from direct sunlight in the summer and must be kept warm in the winter. The scale house should be far enough from the scale deck that the trucks cannot strike it. If drivers must get out of their trucks while on the scale walkway(s) should be provided for safety.

Foundation



A proper foundation is critical to ensure that the scale performs accurately and repeatability.

- (a) **Stable Soil:** Portable scales need a solid base to support the load to be weighed. It is important that the soil under the scale is level and free rocks roots etc that would prevent the timbers from laying flat onto the ground. Poor base soil levelling can cause the timbers to break, flex under load or bend up and support the weigh bridge. Roots rocks or other material under the scale can support the weigh bridge causing incorrect weights.
- (b) **Timbers:** Scales must be level at all times to operate properly. The amount, size and location of timbers required will depend largely on the type of scale and soil conditions. Generally portable scales are installed on 4" X 12" X 12 ' timbers. Usually the minimum amount of timbers used is two (2) timbers under every pair of load cells (for electronic scale) or under each main lever (for mechanical scale). Some newer portable scales have large support base plates to allow installation directly onto gravel. Truck Scales should have support under the end bulkheads to support the vehicle tires driving on and off of the scale. If shims are necessary, steel plates or any other suitable material that resists compression should be used. These shims must cover the entire area under the lever or Load Cell stands or the support plates of the sub frame on a portable scale.

“The importance of a good foundation cannot be over emphasized, as the overall accuracy of the scale begins with the proper support of the device.”

- (c) Debris: Gravel, mud, etc. can build up under the scale and most commonly at the ends where truck driving on and off scale. Debris creates bindings for scale and prevents it from weighing correctly (with common problems such as inconsistency, light weight, not returning to zero...).
- (d) Drainage: Proper drainage of the area surrounding the pit should be provided. This may be achieved by ditching or drainage tiles etc. In any event, water must not be allowed to undermine the foundation or flood the scale.

Approach Ramps

- (a) Legal Requirements: The Approach Ramps must be at least as wide as the scale and level for 3 metres at both ends of the scale. There should be at least 10 metres of straight approach to the scale at each end. The approaches should be free of potholes or bumps.
- (b) Safety: The approaches must be installed in such a way as to allow the driver adequate visibility when driving up onto the scale.

Scale Installation

- (a) Scale Length and Capacity: Ensure that the scale is long enough for all of the trucks to fit on completely. Check that the scale capacity is high enough to weigh full load trucks.
- (b) Bumper Bolts: Most truck scales have two adjustable threaded bumpers at each end to allow the scale to float freely but to check excessive movement of the deck during braking and accelerating. Bumper Bolts are usually set with ¼ inch of clearance or less.
- (c) Cabling: All of the scale connection cables should be protected from damage and should be in good condition and free of nicks or cracks in the protective jacket. Any splices must be waterproofed. Water in the cabling can cause the scale to weigh erratically or drift.
- (d) Junction Boxes: Junction boxes on the scale must be in good physical condition and sealed properly to protect any boards or connection inside them. Water in the boxes can cause the scale to weigh erratically or drift.
- (e) Wooden Deck Scales: Check for broken or missing timbers. Check that the wood at the ends does not contact the approach bulkheads.
- (f) Sub Frame: Portable Truck Scales have a Sub Frame under the weigh bridge to hold the scale components in position during weighing and moving the scale. Check that it is looks square and is not excessively bent.
- (g) Tie Down Bolts: Tie Down Bolts are used during moving or transportation to tie the scale components together. These must be removed or loosened to sufficient clearance before use or they will cause weighing errors.
- (h) Belting at Ends: Truck Scales should have belting that covers the gap between the scale and the abutment walls. This belting prevents rocks and debris from falling into this gap and binding on the deck. The belting should be removable for cleaning and inspection. The belting must not be too rigid or it will transfer weight from the deck to the end walls.

Power Source

- (a) Utility Power: In remote areas or near the end of long distribution lines utility power can be affected by lightning or other induced fluctuations. High Quality Power protection is recommended. (ex: surge protector)
- (b) Generator: Power from generators or heavy current machinery can cause weighing or computing errors if the power fluctuates, spikes or drops especially during start-up. High Quality Power protection is recommended.
- (c) Battery: Batteries provide a stable power source but can become discharged and cause weight errors or shutdown.
- (d) Solar: Solar Cells and Deep Cycle Batteries are a good source of continuous and reliable power.

Printed Tickets

- (a) Legibility: Check that the printout is readable. Check that the weights printed are having proper unit of measure and are in agreement with registration on indicating device.
- (b) Stored Tares: Although it is still common practice to store truck tare weights and use them instead of weighing empty and full for every load, it is possible for the tares to change and cause incorrect weights. Stored Tare weights are technically not allowed

Fully Electronic Scales

Fully Electronic Scales are fully supported by Electronic Load Cells. Almost all of the scales manufactured in recent years are fully electronic due to the ease of fabrication, and low profile. There are many types of Load Cells and Mounts. Most mounting assemblies provide a suspension system to allow the scale to rock back and forth during braking and acceleration and to provide for expansion and contraction of the scale due to temperature changes.



Typical Cell Mount for a Fully Electronic Scale

Mechanical Scale

A Mechanical Scale uses a system of Levers to transfer and proportionately divide down the weight applied to the weigh bridge. The forces are transferred via knife edge ``Pivots``. The resulting forces from two or more levers are summed mechanically and then applied to an indicating device. The Lever Ratio on a truck scale is usually between 100 and 200 to 1. Most mechanical scales have a suspension system that allows them to rock freely. This is a good way to ensure that the deck is not jammed up. Check under and around all of the levers for debris.

Mechanical Scale with weigh beam as indicating device

Inspect the scale house's foundation because it has to support the beam stand. The beam stands should be rigid and not spring under loads especially when a loaded truck is driven onto the scale platform. Normally, one end of the scale house attaches directly to the scale's outer frame while the other end is supported by adjustable legs or timbers.

The weigh beam is connected to the lever system by a metal rod called a steelyard. Make sure the steelyard is plumb and has ample clearance where it passes through the floor. Remove any rags, paper or other material from around this opening. Any contact with debris could cause the steelyard to bind and give an incorrect reading(s).

Inspect the various components of the weigh beam:

- (i) Inspect the pivots and bearings for cleanliness, wear and freedom from rust. Note the position and condition of anti-friction plates and dust caps. Make sure the pivots are centered in their bearing blocks in order to prevent binding.
- (ii) Check the beam notches for cleanliness and wear.
- (iii) Check the weight indication for readability.
- (iv) Ensure the pawls are positively engaged in the beam notches. Check the action and strength of the spring latch.
- (v) Check the poise(s) for any missing parts or loose lead moving inside the poise.
- (vi) Balance the Beam with an empty scale and check for smooth travel. Check the sensitivity by moving the smallest poise up one and then two graduations. At two grads the beam should be at the bottom of its travel.
- (vii) The balancing means must be secured.
 - (1) Be certain that the balance ball is secured in position when the beam is brought to a balance condition.
 - (2) Counter balance hangers should not have any loose material hung on them or weights which are easily removed.



Truck Scale Beam Indicator

Mechanical Scales converted using Load Cell(s) and a Digital Indicator

Locate the Load Cell(s) used on the scale. All Load Cells must be supported solidly. All rods used to transfer the weight must be plumb and free from binding. The wire from the Load Cell(s) must be free and not pulling on the cell. Note: Since the weight from the scale is divided down before it is applied to the Load Cell(s), any force induced into the load cell is amplified.

Example:	Lever Ratio	175 to 1.
	Induced Error at Load Cell	2.47 kg
	Error X Ratio = 175×2.47	= 432.25 kg



S - Type Load Cell

3). Accuracy Test.

Limit of Error

Most contractors use Class III HD portable scales with a capacity less than 100,000 kg and a graduation size (verification scale interval) of 10 kg. The following table is used in calculating in-service Limit of Error

CLASS III HD IN-SERVICE LIMITS OF ERROR

In-service LOE in terms of the number of verification scale intervals	Verification scale interval			
	2 kg	5 kg	10 kg	20 kg
	Load in kg	Load in kg	Load in kg	Load in kg
1	0 - 1 000	0 - 2 500	0 - 5 000	0 - 10 000
2	> 1 000 - 2 600	> 2 500 - 6 500	> 5 000 - 13 000	> 10 000 - 26 000
3	> 2 600 - 4 200	> 6 500 - 10 500	>13 000 - 21 000	> 26 000 - 42 000
4	> 4 200 - 5 800	> 10 500 - 14 500	> 21 000 - 29 000	> 42 000 - 58 000
5	> 5 800 - 7 400	> 14 500 - 18 500	> 29 000 - 37 000	> 58 000 - 74 000
6	> 7 400 - 9 000	> 18 500 - 22 500	> 37 000 - 45 000	> 74 000 - 90 000
7	> 9 000 - 10 600	> 22 500 - 26 500	> 45 000 - 53 000	> 90 000 - 106 000
8	> 10 600 - 12 200	> 26 500 - 30 500	> 53 000 - 61 000	> 106 000 - 122 000
9	> 12 200 - 13 800	> 30 500 - 34 500	> 61 000 - 69 000	> 122 000 - 138 000
10	> 13 800 - 15 400	> 34 500 - 38 500	> 69 000 - 77 000	> 138 000 - 154 000
11	> 15 400 - 17 000	> 38 500 - 42 500	> 77 000 - 85 000	> 154 000 - 170 000
12	> 17 000 - 18 600	> 42 500 - 46 500	> 85 000 - 93 000	> 170 000 - 186 000
13	> 18 600 - 20 200	> 46 500 - 50 500	> 93 000 - 101 000	> 186 000 - 202 000
14	> 20 200 - 21 800	> 50 500 - 54 500	> 101 000 - 109 000	> 202 000 - 218 000
15	> 21 800 - 23 400	> 54 500 - 58 500	> 109 000 - 117 000	> 218 000 - 234 000
16	> 23 400 - 25 000	> 58 500 - 62 500	> 117 000 - 125 000	> 234 000 - 250 000
17	> 25 000 - 26 600	> 62 500 - 66 500	> 125 000 - 133 000	> 250 000 - 266 000
18	> 26 600 - 28 200	> 66 500 - 70 500	> 133 000 - 141 000	> 266 000 - 282 000
19	> 28 200 - 29 800	> 70 500 - 74 500	> 141 000 - 149 000	> 282 000 - 298 000
20	> 29 800 - 31 400	> 74 500 - 78 500	> 149 000 - 157 000	> 298 000 - 314 000
21	> 31 400 - 33 000	> 78 500 - 82 500	> 157 000 - 165 000	> 314 000 - 330 000
22	> 33 000	> 82 500	> 165 000	> 330 000

Table 1 Allowable In-Service Limit of Error

Zero balance

Before checking the zero balance, the scale deck should be cleared of any debris or foreign matter that might adhere to the test weights or otherwise be removed during the tests.

(a) Digital Indicators

Electronic scales are usually returned to zero by pushing a “Zero” button. Older Indicators used a small adjusting screw and a small screw driver to set zero. Once the indicator has been zeroed it will confirm this condition by displaying zero(s). These indicators must not be able to zero off more than 4% of its capacity. To test the zero range drive a vehicle onto the scale that weighs more than 4% of the capacity and press “Zero”. The scale should not go to zero.

Example:

Digital Indicator

- Scale capacity of 60,000 kg

$$60,000 \text{ kg} \times 4\% = 2,400 \text{ kg}$$

The maximum weight that the scale can legally zero off is 2,400 kg

(b) Weigh Beam

Within the poises at their respective zero indication, bring the beam to a balance condition by only using the balancing devices supplied by the manufacturer. The beam will be in a balanced state when it comes to rest at a point mid-way in the trig loop, or oscillating through approximately equal arcs above and below the centre of the trig loop.

Motion detection

Digital Indicators are required by law to reject or delay commands to print or to zero the scale while the weight is in motion. The maximum amount of motion allowed is 3 graduations per second of motion. To test the zero function, have a person step onto the scale. Press the “Zero” button just as the numbers begin to increase. The scale should either reject the command or delay it until the weight has settled.

Section test (for vehicle scale)

A section is described, in a lever scale, as a **pair of main levers** and in a full load cell scale, as a **pair of load cells**. The plane of a section is the vertical plane perpendicular to the longitudinal axis of the scale and passing through the centers of the main load pivots or the centers of the load cells.

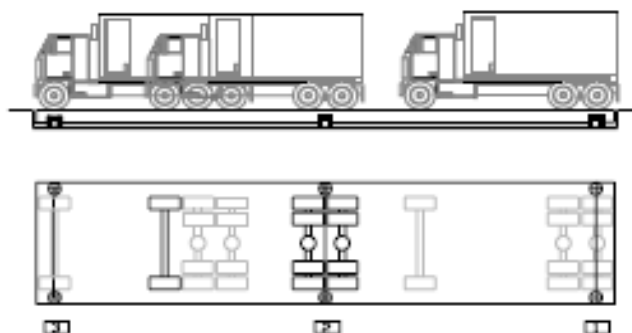
A loaded vehicle with a gross weight of at least 20 tonnes is driven onto the scale deck and parked with the heavy axles parked over all of the sections going in both directions. The weight readings for each section are recorded and checked for any differences between the sections.

- (a) On a two section scale, the loaded vehicle is driven onto the scale deck until the rear wheels are scale borne. This indication is recorded in the Scale Accuracy form under Performance Test Section. The vehicle is driven forward until the front wheels are just scale borne. Record the weight indication on the form also. Drive the vehicle off the scale and note any changes to the zero balance. Re-zero the scale if necessary.

The loaded vehicle is **turned around** and driven back onto the scale deck until the rear wheels are scale borne over the opposite section. The indicated weight is recorded on the form. The vehicle is driven forward until the front wheels are just scale borne. Once again the indication is recorded.

Note: The weight of the vehicle, used for the test, must not be more than 75% of the scale's capacity if it is a two section scale. Where you have more than two sections the weight of the vehicle can not be more than 50% of the scale's capacity.

- (b) A four section scale will be tested in a similar manner. The loaded vehicle is driven onto the scale platform from one direction. The rear axle(s) are placed over the first section. The weight indication is recorded. Next the vehicle is moved ahead to the second and third sections and the readings recorded. After this reading, the vehicle is positioned over the last section and the weight indication recorded. Drive the vehicle off the scale and turn it around.



3 sections vehicle scale

The difference between the results for different positions of the load must not exceed the absolute value of the In-Service Limit of Error for that load (refer to Table 1 on page 15).

Example:

Following weights are recorded for a scale with graduation of 10 kg:

Highest weight: 25,120 kg

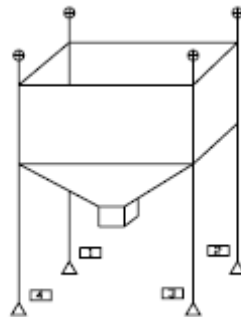
Lowest weight: 25,070 kg

Difference: 25,120 kg – 25,070 kg = 50 kg

For a load of 25,000 kg (i.e., within the range of 21,000 kg – 29,000 kg) and scale graduation of 10 kg, the In-Service LOE in terms of the number of verification scale intervals is 4. Therefore the maximum allowable In-Service Limit of Error from Table 1 is 4 X 10 kg = 40 kg

Corner Test (for Silo hopper scale)

- Zero scale
- Use a load of at least 10% of **Max** without exceeding 25% of **Max**. Apply the load to each point of support (corner where load cell resides). Do not apply the load to bars that extend outward from the point of support to prevent cantilevering the scale.
- Record the indications.
- The difference between the results for different positions of the load must not exceed the absolute value of the In-Service Limit of Error for that load.



Example:

Four corner weights are recorded for a scale with graduation of 10 kg:

Corner #1 : 2,020 kg #2 : 2,010 kg #3 : 2,020 kg #4 : 2,010 kg

Difference: 2,020 kg – 2,010 kg = 10 kg

For a load of 2,000 kg (i.e., within the range of 0 kg – 5,000 kg) and scale graduation of 10 kg, the In-Service LOE in terms of the number of verification scale intervals is 1. Therefore the maximum allowable In-Service Limit of Error from Table 1 is 1 X 10 kg = 10 kg

Known Standards Test

If the scale passes the section test, proceed to the performance test using known standards (test weights).



- (a) Zero scale
- (b) Apply the test weights incrementally. Record each weight indication as the test weights are applied. All indications should be within the In-Service Limit of Error as listed in Table 1

Example (scale with minimum graduation of 10 kg):

For total test weights up to 5,000 kg, the allowable In-Service Limit of Error is 10 kg.

For total test weights greater than 5,000 kg and up to 13,000 kg, the allowable In-Service Limit of Error is $2 \times 10 \text{ kg} = 20 \text{ kg}$.

For total test weights greater than 13,000 kg, refer to Table 1.

Strain test

To verify linearity of scale, a strain test must be carried out. It is desired to test scale to normal weighing range therefore a loaded vehicle of similar weight as the trucks to be used on the project should be used. This load is referred to as a strain load. Test weights are then applied in conjunction with the strain load

- (a) Zero scale

- (b) Position the strain load on scale.
- (c) Record the weight of the strain load
- (d) Apply test weights to the scale. Record each weight indication as the test weights are applied. All indications should be within In-Service Limit of Error as listed in Table 1. Note that the number of verification scale intervals for this procedure is **only based upon the test weights (Known Standards) applied** and not based upon the total of the strain load plus test weights
- (e) Remove weights and vehicles and check the zero balance once again.



Strain Testing a Portable Truck Scale

Example (scale with minimum graduation of 10 kg):

Strain load is recorded as 25,100 kg.

A 500 kg test weight is applied. The scale indication should be 25,600 kg +/- 10 kg.

The variation of scale indication for further test weight application up to 5,000 kg shall be within +/- 10 kg.

The variation of scale indication for further test weight application above 5,000 kg shall be within allowable In-Service Limit of Error listed in Table 1.

4). Complete the Scale Accuracy Inspection Form

Each time a scale is moved and installed Measurement Canada requires the scale owner to provide the following information to nearest Measurement Canada office within five days of the installation:

- i.) Name and address of the Contractor;
- ii.) Make, model and serial number of the device(s);
- iii.) Capacity of the device, and
- iv.) Address and description of the place where the device is installed.

Alberta Transportation also specifies that before a scale is used the Contractor is to complete an accuracy test and inspection in the presence of the Consultant. Those results are to be provided to the Consultant – see Scale Accuracy Inspection form on page 25.

The Consultant is to forward a copy of the results to the Alberta Transportation Project Administrator.

Responsibility of Owner and User

The mission of Measurement Canada is to serve all Canadians by ensure accuracy in measurement and inequity where commodities and services are traded on the basis of measurement.

(a) Section 24 of the Weights & Measures Act States:

“Every trader is guilty of an offence who uses, or has in his possession for the use in trade any device that

- (a) Is not installed in accordance with the requirements of the regulations; or
- (b) Does not measure units of measurement within the limits of error prescribed.”

This section holds the trader responsible for the proper installation and maintenance of his device.

(b) Section 29 of the Act is equally applicable to both the trader and service organizations. In general terms, it is an offence under the Act to adjust or repair a device without sending a written report to the nearest Measurement Canada office. Sections 40 and 41 of the Regulations outline what type of information is required.

(c) Section 33 of the Act states that the trader shall not over measure on a sale or under measure on a purchase.

(d) Section 38 of the Regulations requires a trader who installs or causes to be installed for use in trade any device that, before it is used, is installed on a base, foundation, frame or other means of support, or is incorporated into a structure or system specifically made or prepared for the device, and the manner of installation can affect the performance of the device, make a report within five days after the date of the installation in writing to the nearest Measurement Canada office containing the following information:

- the name and address of the trader;
- the make, model and serial number of the device;
- capacity of the device; and
- the address and description of the place where the device is installed.
- the address and description of the place where the device was previously installed if a device has been removed from its installation and is installed again.

- (e) Section 206 of the Regulations requires the user to adjust the registration to zero before use.

- (f) Section 208 of the Regulations requires the load being weighed to be fully supported on the scale and stationary before the weight value is observed and recorded.

Responsibility of Service Organization

Whenever a service organization repairs, adjusts or alters a device which also includes the breaking of seals, they must make a written report to the nearest Weights and Measures office.

- (a) Section 29 of the Act covers the reporting of repairs, alterations and adjustments.
- (b) Section 30 of the Act deals with removing or breaking marks and seals placed on the device by an inspector or scale technicians. This section also applies to the owner or user of the device.
- (c) Regulations 40 and 41 specify the type information that has to be sent to Weights and Measures. See Appendix E for this legislation.

The foregoing is an outline in general terms of areas of responsibilities under the Weights & Measures Act and Regulations. It is not possible to cover all contingencies in this brief outline, if in doubt, call the closest Measurement Canada Office for guidance.

APPENDIX A

LOCAL MEASUREMENT CANADA OFFICES

Edmonton District:

Measurement Canada
Name: Don MacDougall
Title: District Manager, Edmonton
Phone: (780) 495-2491
Fax: (780) 495-7724
E-mail: macdougall.don@ic.gc.ca
Assistant: (780) 495-2491

Calgary District:

Measurement Canada
Name: Terry Reid
Title: District Manager, Calgary
Phone: (403) 292-5406
Fax: (403) 292-6175
E-mail: reid.terry@ic.gc.ca
Assistant: (403) 292-5605

Website links:

- Legislation - [Weights and Measures Act](#) and [Regulations](#). These links take you directly to Justice Canada's web site for the rules and requirements governing mass measurement (or measurement by weight) in Canada.

<http://laws.justice.gc.ca/en/W-6/C.R.C.-c.1605/index.html>

- [Specifications](#) - A detailed description and criteria for weight measuring devices (e.g., scales)

http://strategis.ic.gc.ca/epic/site/mc-mc.nsf/en/h_lm02152e.html

CONTRACT NO. _____ PROJECT NO. _____ DATE INSPECTED _____

CONTRACTOR		SCALE LOCATION	
LAST DATE CERTIFIED BY MEASUREMENT CANADA ²		HOW LONG AT THIS LOCATION:	
MAKE & MODEL OF SCALE	MIN.GRAD	SERIAL NO.	CAPACITY-KGS.

Performance test Section	1	2	3	4	5	6
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Satisfactory	Unsatisfactory
DRAINAGE	<input type="checkbox"/>	<input type="checkbox"/>
APPROACHES	<input type="checkbox"/>	<input type="checkbox"/>
BASE TIMBERS	<input type="checkbox"/>	<input type="checkbox"/>
MOVING PARTS CLEAR & LEVEL	<input type="checkbox"/>	<input type="checkbox"/>
ENDS OF DECK CLEAR	<input type="checkbox"/>	<input type="checkbox"/>
BEAM CONDITION, CLEARANCE	<input type="checkbox"/>	<input type="checkbox"/>
BEAM SHACK INSTALLATION	<input type="checkbox"/>	<input type="checkbox"/>
SENSITIVITY ZERO	<input type="checkbox"/>	<input type="checkbox"/>
SENSITIVITY FULL LOAD	<input type="checkbox"/>	<input type="checkbox"/>
SEALS AND MARKINGS	<input type="checkbox"/>	<input type="checkbox"/>

WEIGHT TEST

TEST WEIGHTS APPLIED _____
 SCALE INDICATION _____
 VARIANCE _____

STRAIN LOAD TEST

INDICATED VEHICLE WT _____
 PLUS TEST WEIGHTS _____
 SCALE SHOULD INDICATE _____
 ACTUAL SCALE INDICATION _____
 ERROR - PLUS OR MINUS _____

Remarks _____

Original to:
 Measurement Canada
 4940 - 93 Avenue
 EDMONTON, Alberta T6B 2L6
 Ph(780) 495-2491
 Fax(780) 495-7724

INSPECTION FIRM: _____

INSPECTED BY: _____

CONSULTANT: _____

OR
 #400 639-5 Avenue. S.W.
 CALGARY, Alberta T2P 0M9
 Ph(403) 292-5605
 Fax(403) 292-6175

CONSULTANT'S REPRESENTATIVE: _____

Copy to: Consultant
 Consultant to forward a copy to the Project Sponsor.

- Scale accuracy testing to be conducted, in the presence of the Consultant.
- The most recent certificate issued by Measurement Canada is to be displayed.

Precision Scale contact information

Precision Scale was established in 1963. Since this time the company has steadily grown from a small scale service shop to one of western Canada's leading weigh scale and weighing solutions supplier. In 1996 we moved into our present location, which is more than three times the size of our previous location, enabling us to devote more attention to the efficient fabrication process of our heavy capacity truck, railway and cattle scales. We sell and service a large variety of weighing equipment, from an ever expanding source of scale manufactures from around the world, to meet the ever-changing demands of the industry today.

Customers choose Precision Scale for Quality, Integrity and Technical Expertise.



Contact

Email: info@precisionscale.com

- **Tel:** (780) 463-0026
- **Fax:** (780) 463-0711
- **Toll Free (Canada):** 1-800-831-5657

- 7217 Girard Road
- Edmonton, Alberta
- Canada, T6B 2C5