SENATE HIGHWAYS
EXHIBIT NO. 3
DATE 3-5-2013
BILL NO. HB 157

September 2006

Split-draft Weighing

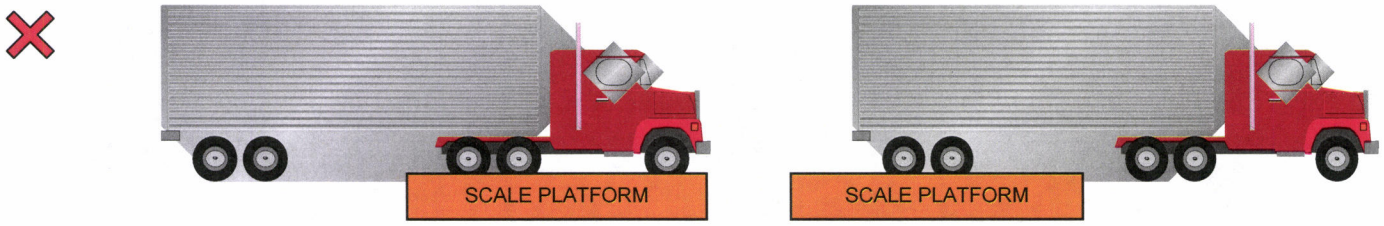
By Juana Williams

Since the 1930s the weights and measures community has raised questions about the practice of "split-draft weighing" a vehicle when the length of the vehicle exceeds the length of the scale platform. This article examines this practice and the related NIST Handbook 44 requirement that applies when determining the weight of a vehicle used in commercial applications.

The practice of split-draft weighing occurs when the front tractor or truck of the vehicle or vehicle combination (that is coupled or attached by connectors for the purpose of towing) are weighed, then the uncoupled trailer unit(s) or rear portion of the vehicle is weighed and the two weights are totaled for the vehicle weight (see the example in Figure 1 below). The practice is also referred to as "two-draft weighing," "two spotting," "double weighing," or "double-draft weighing."

Step 1: Determine Weight 1

Step 2: Determine Weight 2



NOT LEGAL
NO REPEATABILITY

Step 3: Weight 1 + Weight 2 = Vehicle Weight

Figure 1: Split-draft Weighing

Note that this practice is different from the acceptable practice of single-draft weighing in which the entire vehicle does not exceed the scale platform length (see Figure 2) or the case of single-draft weighing on a scale with multiple platforms in which the length of each vehicle combination does not exceed the platform where it rests (see Figure 4 below).

LEGAL WEIGHT
ACCURACY &
REPEATABILITY

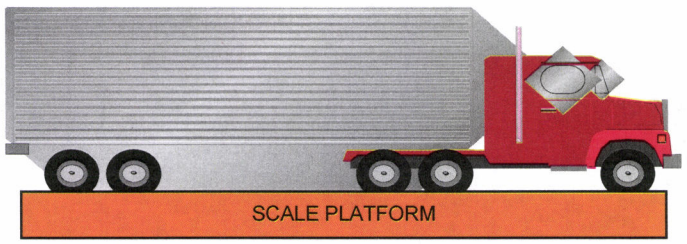


Figure 2: Single-draft Weighing of a Vehicle

In the 1930s rapid changes in the trucking industry resulted in new models of trucks with wheelbases longer than existing scale platforms. The practice of split-draft weighing began as a time-saving method (to eliminate the time spent uncoupling, moving, and recoupling the vehicle components, e.g., tractor and trailer) for determining truck weights on scales of insufficient length.

In 1938, in response to concerns about the appropriateness of split-draft weighing, NIST conducted a study that examined the errors associated with this practice. The study demonstrated that certain factors beyond the scale's performance contribute to the uncertainty in the weighing process:

- The grade and level of the approach below that of the scale result in a lower weight for a vehicle component.
- A vehicle or a vehicle combination of like design results in less external forces during each weighing.
- The nature and distribution of the load on the vehicle axles (e.g., liquids shift to a greater degree) affect the level of these external forces.
- The amount of shift in the load, which is more likely to occur the steeper the approach grade or with a quick stop on the platform, has an influence on the vehicle weight.
- The center of gravity for each vehicle unit as it relates to the shift of the load and type of commodity impacts the magnitude of these forces.
- Braking when pulling on the scale can cause the scale to bind resulting in a lighter weight.
- The proximity of the vehicle to the scale; the closer the vehicle is to the scale, the less external influence is on the vehicle's weight.

Given most transactions involve processes for determining both gross and tare weight (two weighings), when these external factors are introduced during both steps of the weighing process, the errors they contribute were found to total as high as 5.5 %. Additional studies were conducted in 1954 with similar results.

In 1955, the National Conference on Weights and Measures adopted an earlier version of current paragraph UR.3.3. Single-Draft Vehicle Weighing (a requirement that became effective in 1957) to address its concern about the practice of split draft weighing. This paragraph appears in the current edition of NIST Handbook 44 as follows:

> **UR.3.3. Single-Draft Vehicle Weighing.** - A vehicle or a coupled vehicle combination shall be commercially weighed on a vehicle scale only as a single draft. That is, the total weight of such a vehicle or combination shall not be determined by adding together the results obtained by separately and not simultaneously weighing each end of such vehicle or individual elements of such coupled combination. However:

(a) the weight of a coupled combination may be determined by uncoupling the various elements (tractor, semitrailer, trailer), weighing each unit separately as a single draft, and adding together the results, or

(b) the weight of a vehicle or coupled-vehicle combination may be determined by adding together the weights obtained while all individual elements are resting simultaneously on more than one scale platform.

Note: This paragraph does not apply to highway-law-enforcement scales and scales used for the collection of statistical data. (Note Added 1992)

Paragraph UR.3.3. requires that only single- draft weighing be used for commercial vehicle weighing applications. That is, the entire vehicle must be weighed on a scale of sufficient length. Commercial applications are those in which the weight indications are the basis for custody transfer, buying or selling, or determining transportation charges.

Paragraph UR.3.3. also specifies other acceptable methods for commercial weighing operations where the vehicle's wheelbase is longer than the scale platform. These methods are prescribed in sections (a) and (b) and illustrated in Figures 3 and 4, respectively, on page 4. In section (a) the vehicle or vehicle combination can be uncoupled then weighed as single drafts. In section (b) the vehicle combination is weighed in single drafts on multiple weighing elements interfaced with a totalizing indicating element, where the weights are totalized. In either case the important point is that the vehicle or component should rest completely on a platform.

In 1992, paragraph UR.3.3. was modified to include a note to clarify that the requirement (for only single-draft weighing of commercial vehicles) does not apply to highway law enforcement scales and scales used to collect statistical data. While split- draft weighing is not ideal, the results prove to be accurate and practical enough to permit the practice in law enforcement and data collecting applications. Even though the sources for errors in split-draft weighing remain the same and deserve consideration, the weights and measures community has not changed its position to accept the practice as a necessary method of use in law enforcement and statistical weighing applications. Yet periodically over the past 60 years, the community has made changes to the Handbook because more stringent performance tolerances were warranted as improvements were made to scale technology used in these applications. The same limitation to only single-draft weighing does not apply to railway track scales.

It has been over 50 years since a formal study was conducted indicating that split- draft weighing is not appropriate; however, some suggest that it is time for a new study. While weighing technology continues to advance, no evidence has yet been presented to indicate that split-draft weighing consistently provides a sufficient level of accuracy for commercial vehicle weighing. In fact, some jurisdictions that have conducted informal

studies on the practice continue to support the Handbook requirement for only single draft weighing of commercial vehicles.

If you have any questions about this information, please contact Juana Williams at 301-975-3989 or at juana.williams@nist.gov.

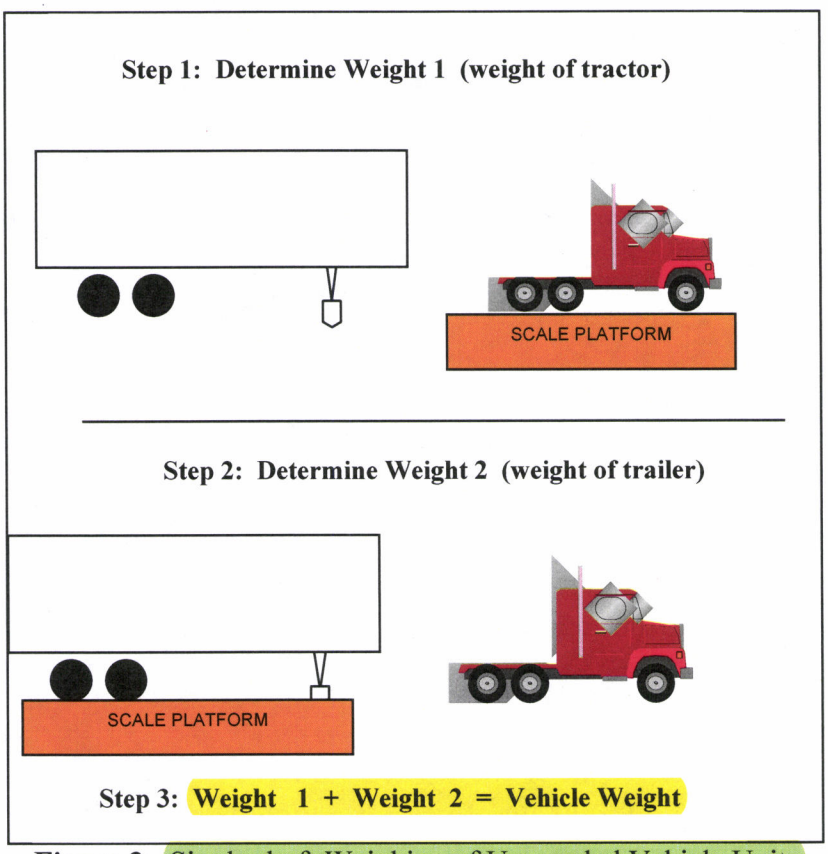


Figure 3: Single-draft Weighing of Uncoupled Vehicle Units (tractor and trailor)

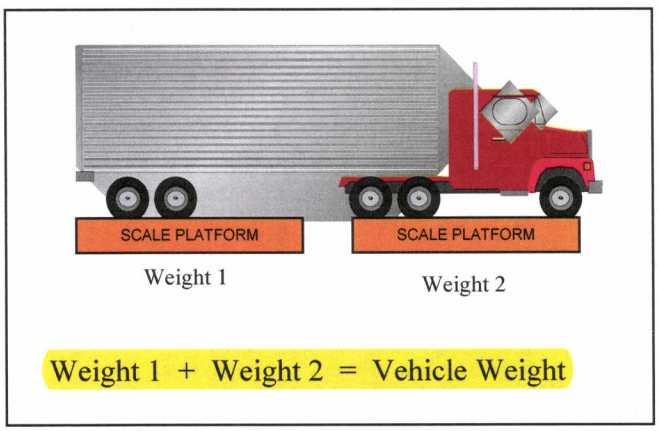


Figure 4: Simultaneous Single-draft Weighing of Coupled Vehicle Units Resting on More than One Scale Platform

National Conference on Weights and Measures
"That Equity May Prevail"

February 27, 2013

Senate Highways and Transportation Committee
c/o The Honorable Elsie Arntzen, Chair
Montana Legislature
Helena, Montana

RE: HB 157

Dear Senator Arntzen,

With this letter, I urge the Committee's opposition to provisions of HB 157 that would make it lawful to split weigh all commodities transported by truck, truck trailer, or semitrailer. The National Conference on Weights and Measures has existed since 1905 for the primary purpose of bringing public and private interests together to establish United States standards for weights and measures. In that 108-year history, no supporting data has been brought forward to support split weighing as a sound commercial practice.

This is not to say that there has not been sufficient study of the matter. Studies that have been done, such as a 2004 study in Kansas, would indicate that the practice actually instills a considerable bias in results toward under registration. In other words, the scales tend to weigh light when split weighing. Furthermore, the majority of weight values in the study are in excess of acceptable commercial tolerances.

By making the practice lawful, the state of Montana would mislead the public to believe the practice is appropriate. Truly it is not. The Kansas data would indicate that the scale owner who is selling commodities could unknowingly be giving away some or all of the profit margin, thus putting the business at risk of failure. The scale owner who is buying commodities would have a significant unfair competitive advantage over others who have invested in proper scale installations and employ sound commercial weighing practices, not to mention the financial harm to the customers. Either way, the level playing field will have become a luxury of days gone by.

Sometimes we learn from our mistakes because we didn't know better. In this case, we can learn from those who do know better. Split weighing is bad practice. Please oppose it in Montana legislation. At a time when every dollar counts, the need for accuracy has never been more important.

Respectfully,

Don Onwiler
Executive Director

1135 M Street, Suite 110 | Lincoln, Nebraska 68508
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FAIRBANKS SCALES

WEIGHING EQUIPMENT FOR THE WORLD

February 28, 2013

Senator Elsie Arntzen
Chair, Senate Highways and Transportation Committee
Montana Senate
Helena, Montana 59620-0500

Dear Senator Arntzen,

I am writing this letter to express my opposition to House Bill 157. This House Bill would allow the net weight of commodities being transported by truck, truck tractor, trailer, or semi trailer to be determined by "split weighing". Split weighing is a practice where the entire vehicle cannot be weighed in a single draft, because the vehicle exceeds the scale platform length.

You need to answer two questions, does HB 157 penalize scale owners who have upgraded their devices to comply with the current law or does HB 157 really address one device owner who doesn't want to purchase an appropriate device?

There have been a number studies over the years, both formal and informal, that have looked at this issue. The studies demonstrate that certain factors beyond the scales performance can contribute to uncertainty in the weighing process. These factors, such as a shift in the load caused by a quick stop or the condition, length, and angle of the vehicle scale approach and exit ends, will impact the accuracy of the weighment.

The Weights and Measures Regulatory Community recognized the inherit problems with split weighing early on. During the 1950's, the Scale Code found in NIST Handbook 44 added a requirement that still exists today. It states: "*a vehicle or a coupled vehicle combination shall be commercially weighed on a vehicle scale only as a single draft*". NIST Handbook 44 provides model standards for weighing and measuring devices. It is adopted and/or used by all 50 States, including the State of Montana.

Fairbanks Scales has provided top quality weighing equipment and dependable scale service for over 180 years. We are a recognized leader in vehicle scale manufacturing and the installation of these weighing systems across the United States including Montana. Again, I ask that you oppose House Bill 157.

Sincerely yours,

Louis E. Straub
Regulatory Affairs Consultant

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Chair Elsie Arntzen
Senate Highways and Transportation Committee
Montana Legislature
PO Box 201706
Helena, Montana 59620

February 28, 2013

Subject: Proposed Split Weighing Legislation in Montana

Dear Chair,

The purpose of this letter is to provide METTLER TOLEDO's position on proposed House Bill 157 which would allow split weighing of commodities in the State of Montana. While we have not conducted any formal engineering tests on the accuracy results of the split weighing of trucks, we base our input on many years of application experience on the installation and use of vehicle scales of all sizes.

METTLER TOLEDO would strongly oppose any legislation that would allow the use of split weighing in any commercial weighing application. The use of split weights, which by its very nature have the ability to induce large inaccuracies, would in our opinion, promote the use of potentially incorrect weights for the purpose of calculating a charge for a commercial transaction. The variation in each weighment from the live-to-dead connection where even the smallest change in elevation differences across these connections allow for a scale to pass an accuracy test under controlled circumstances, but then provide inaccurate weights when weighing a truck. Split weighing is an affordable, space saving way to get estimated weights on a vehicle, but cannot provide the repeatable, accurate weights required to provide equity in a commercial transaction.

I hope this information helps you in your decision to oppose House Bill 157.

Regards,

Darrell Flocken
Quality & Compliance Manager
Mettler-Toledo, LLC

METTLER TOLEDO

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

January 15, 2013

Mr. Timothy Lloyd
Bureau Chief
Montana Weights & Measures Bureau
PO Box 200516
Helena, MT 59620

Dear Mr. Lloyd,

The United States Department of Commerce, National Institute of Standards and Technology (NIST), Office of Weights and Measures, is responsible for securing uniformity of weights and measures laws and practices throughout the United States. NIST achieves this by publishing the model weights and measures laws and regulations contained in NIST Handbooks 44, 130 and 133, which the states adopt into law for enforcement purposes. NIST also provides technical advice and expertise to weights and measures officials, including the Montana Weights & Measures Bureau, and to industry and manufacturers on issues related to commercial transactions based on measured quantities. I am writing in response to your request for our views on the use of split draft weighing during a commercial transaction.

The practice of split-draft weighing occurs when the front tractor or truck of the vehicle or vehicle combination (that is coupled or attached by connectors for the purpose of towing) are weighed, then the trailer unit(s) or rear portion of the vehicle is weighed and the two weights are totaled for the vehicle weight. The practice is also referred to as "two-draft weighing," "two spotting," "double weighing," or "double-draft weighing."

NIST's long-standing recommendation has been, and continues to be, that split draft weighing should not be used when conducting commercial transactions by weight. I have attached three studies and a newsletter article published by NIST that explain and highlight our concerns with split draft weighing.

Over 70 years ago, NIST (then called the National Bureau of Standards) published a paper titled, "Two Draft Weighing of Motor-Vehicle Loads," which was presented to the National Conference on Weights and Measures (NCWM) in 1938. The conclusion of this paper, that "[u]nquestionably, the fundamental conclusion to be drawn from the studies reported upon

herein is that the two-draft method of weighing vehicles is too fraught with elements of uncertainty to be a satisfactory means for determining the weight values of transported loads," is as valid today in 2013 as it was in 1938.

In Canada, a formal study was conducted in 1977 to determine the effects of off-level approaches on weighing accuracy, and in 2004, the State of Kansas conducted a study which reconfirmed the findings of these previous studies.

Because single platform weighing requires a greater investment than split draft weighing using smaller equipment, the accuracy of weights obtained from split draft weighing has been the subject of scrutiny over many years. However, it is accepted that split draft weighing has the potential to result in weighing errors that exceed the scale tolerances applicable to vehicle scales used for commercial transactions. Because of potential errors, split draft weighing is not permitted for commercial applications, as noted in NIST Handbook 44. As you are well aware, all fifty states adopt NIST Handbook 44, *Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices.*

The accuracy of weights obtained by split draft weighing depends upon many factors, some of which are the accuracy of the scale, the shifting of the load on the truck as the truck goes onto the scales, the extent to which the scales are level when being used, the setting of the truck brakes during the weighing process, the care used in the weighing process, and the truck suspension system. The studies that have been done to date confirm the view of NIST and the NCWM that split draft weighing is not sufficiently accurate for commercial purposes.

Please contact me if I can be of further assistance.

Best regards,

Carol T. Hockert

Carol T. Hockert, Chief
Office of Weights and Measures

Encls.

Cardinal
Cardinal Scale Manufacturing Co.

January 14, 2013

Representative Steve Lavin
Chairman House Transportation Committee
Montana Legislature
Helena, Montana

RE: House Bill HB 157

Dear Representative Lavin,

Recently we became aware of the above referenced bill to allow split weighing for commercial use within the State of Montana. Cardinal Scale Manufacturing Company is opposed to the use of split weighing to determine gross vehicle weights. Our opposition is based on the fact that split weighing of vehicles is not an accurate method of obtaining a vehicle's weight.

Our company has been manufacturing vehicle scales since the 1950's. We have found that vehicle axle weights are never constant and change with the movement of the vehicle. This is due to a number of factors including the characteristics of the vehicle's suspension, movement or friction in the fifth wheel (attachment of the trailer) and whether the vehicle's brakes are applied during the weighing process. Further, for split weighing, you can add the elevation of the pavement preceding and following the scale platform to the list of error sources. Each time the vehicle is moved to weigh the next axle in a split weighing procedure, the axle weights will change. Without knowledge of the vehicle's specific suspension characteristics, it is impossible to predict whether the axle weight will increase or decrease or even remain the same.

Even when the vehicle is weighed on a multi-platform vehicle scale, the axle weights observed are only for that snapshot in time. Move the vehicle forward or backward only a few inches and the axle weights will change while the gross or total weight remains unchanged. The same thing happens in a split weighing procedure resulting in axle weights changing each time a axle weight is recorded. When you add the individual axle weights up to determine the gross or total vehicle weight, you will include these changes resulting in a potentially substantial error. I personally have witnessed changes as much as 1100 pounds for a tandem axles moved just a few inches. Typical values run 300 to 500 pounds per axle so, for a five-axle Class 9 vehicle, you could easily have a 1500 to 2500 pound error in the total vehicle weight.

These changes in axle weights were recognized some time ago. In 1954 at the 39th meeting of the National Conference on Weights and Measures, Mr. D.R. Tate of the United States National Bureau of Standards (now the National Institute of standards and Technology) gave a report entitled *Investigation of Axle Load Weighing*. A copy of that report is included with this letter. In this report, Mr. Tate concluded that *Weight, defined as the sum of the gravitational forces acting on all the particles of a*

body, certainly is a fixed and definite quantity, but this results in repeatability only when the entire body is placed on the scale platform. Thus, split weighing cannot be used to accurately determine the total or gross weight of the vehicle since the entire vehicle is not weighed at one time.

The referenced bill would allow the practice of adding individual axle weights to obtain the total vehicle weight resulting in the likelihood of substantial errors in the gross vehicle weight and jeopardizing fair and equitable weight measurements to the citizens of Montana. We urge you to oppose this action.

Should you have any questions or if we may be of future service, please do not hesitate to contact me.

Very truly yours,

Stephen Langford, P.E.
Vice president, Engineering Services

enclosure

39TH MEETING OF
THE NATIONAL CONFERENCE
ON WEIGHTS AND MEASURES

Under item 2, there was raised the possibility of holding the National Conference in cities other than Washington. On this point, the Executive Committee decided to recommend that Washington continue to be the site of National Conferences because the Conference is sponsored by the National Bureau of Standards and all detail arrangements are administered by staff members of that organization.

MR. HAGGART: I would like to recommend that definite efforts be made by all weights and measures officials to increase the amount of publicity received by the National Conference and by individual departments.

MR. BAUCOM: I suggested that the Conference Committee consider the possibility of planning a banquet to replace the informal Conference party for the reason that it is my thought that greater publicity would be received if a banquet is held.

MR. CHRISTIE: One of the reasons that the Executive Committee did not recommend the banquet is that obviously such an event would increase the cost of the Conference to all those who desire to attend such an affair.

MR. CRAWFORD: I want to discourage the thought of considering other locations for future Conferences. It appears to me that both the success and the growth of the Conference are due largely to the material assistance received from the National Bureau of Standards. Such assistance would not be possible in any location other than Washington.

INVESTIGATION OF AXLE LOAD WEIGHING

By D. R. TATE, *National Bureau of Standards*

Weights and Measures officials are becoming increasingly familiar with problems involved in determining axle loads of motor vehicles. The importance of the task can be appreciated if one considers that an expected development is the extension of the method to the determination of weight for tolls on major toll highways.

We have been asked to make an investigation of these methods for determining axle loads and gross weights by multiple draft weighing. Motor trucks have increased in length from the 24 feet or so of a few decades ago up to 50 feet or more. Since scales having platforms long enough to weigh such trucks are not commonly available at highway check points, individually measured axle loads must often be added up to determine the gross weight. The determination of individual axle loads is, of course, a feature of modern highway traffic regulation.

A typical incident arising from the shortcomings of the multiple draft method occurs when a truck driver stops at a State weighing station and is given a ticket because his truck is overweight. He had had his truck checked, just before starting his trip, on scales which he had every reason to believe were accurate. Now he finds that he is 1,500 or 2,000 pounds beyond the limit. He feels that he has been mistreated and that it is up to the weights and measures officials to regulate the weighing in such a way that this cannot happen.

One thing basic to any measurement problem is the determination of the constancy of the quantity being measured. All of us, when we think of weight, have the feeling that the object being weighed must

be very constant and that if any discrepancy occurs between two weighings, it is usually the scales or the operators which are at fault. When we use the term "axle weight," the listener infers that we are measuring just such a constant and repeatable quantity. The National Bureau of Standards, therefore, made its introductory experiments a study of the constancy of "axle weights."

We conducted our experiments using a scale installation located near Woodbridge in the state of Virginia. R. D. Thompson, Supervisor of Weights and Measures for the Virginia Department of Agriculture, and J. P. Mills, Jr., Traffic and Planning Engineer for the State Highway Department of Virginia, together with members of the staff of the American Trucking Associations, Inc., cooperated in the experiments. The installation consists of three independent scales, two 24-foot platforms with a 10-foot platform between them. This installation permitted us to weigh a tractor-trailer combination in a number of positions such that in each position, although the axles were on different scales, all axles were weighed simultaneously. With a truck in a single position we could weigh the front axle, the driving axle and the trailer axles. We weighed 30 trucks, 23 of them with tandem axles on trailers and 7 of them with single trailer axles, in from 16 to 20 different positions depending on the number and spacing of the axles.

In not every case were we able to weigh all axles simultaneously, but we found all the results useful in the study.

Variations in axle load measurements can arise from three possible causes: errors in the scales, the scales not operating properly because of constraints introduced by the truck, or variations in the axle weights themselves. We eliminated the possibility of errors in the scales by calibrating them before and after the test. During the calibration, the errors did not exceed 20 pounds, the minimum graduation, at any location. We eliminated the possibility of the accuracy of the scales being affected by the truck by totalling all axle weights obtained simultaneously to see whether the gross weights so obtained agreed between different positions. On the average the gross weights so calculated varied by 50 pounds for each truck. Since this value was within the limits which might arise from the sum of the individual scale errors, the results indicated reliable performance. The scales were calibrated again at the conclusion of the experiment, the calibrations agreeing very well.

The approaches to these scales are fairly level and the scales are provided with concrete platforms. We felt that the fluctuations observed were indicative of those one might expect from trucks running on a level roadway.

The results of some of our tests are given in the following table.

Observed variation in axle weights of tractor-trailer combinations

	Single axle trailers		Tandem axle trailers	
	Maximum value	Value exceeded by 50% of trucks	Maximum value	Value exceeded by 50% of trucks
	lb	*lb*	*lb*	*lb*
Front axle	280	80	420	110
Drive axle	140	70	670	200
Single rear axle	90	40	------	------
Both tandem rear axles	------	------	480	250
One tandem rear axle	------	------	2, 980	2, 000

These results were obtained from tractor-trailers having a single front axle, a single drive axle, and either single or tandem rear axles on the semitrailer. The first and third columns give the maximum variation observed. The second and fourth columns give the variations shown by more than 50 percent of the axles tested.

With tandem axles, the variation was more pronounced. The fourth and fifth lines show fluctuations of a single member of the tandem and the shifting between front and rear members of the tandem pair.

A last item is of interest to those who have sometimes made the assumption that the load is shared equally between the members of a tandem; in one case a difference of 7,350 pounds was observed and 50 percent of the trucks differed by at least 1,200 pounds.

These variations are the kind one must expect whenever and wherever axle loads are weighed. Note that they appeared spontaneously as the trucks moved slowly across the three scales. They are, therefore, the minimum amount of scatter which one can expect in a multiple draft weighing. No matter how accurate our scales or how careful the weighmaster, these variations are bound to appear.

It has been my personal feeling that a term such as "axle weight" is undesirable because it suggests the weight of an axle as a fixed and definite quantity, subject to accurate and repeatable measurement. Weight, defined as the sum of the gravitational forces acting on all the particles of a body, certainly is a fixed and definite quantity, but this results in repeatability only when the entire body is placed on the scale platform.

If a body such as a truck is supported partly on the ground and partly on a scale, the quantity measured by the scale is not a weight but merely a load reaction. It is that portion of the total weight which happens to be on that wheel or axle at the moment. The fact that this value may, under different conditions of topography, vary anywhere between zero and nearly the total weight of the truck does not mean that the values read from the scales are inaccurate.

The experiments which we have described above show that when a truck is moved over a fairly smooth and level roadway, axle load reactions may vary by amounts as great as 500 or 600 pounds. Shifts among pairs of tandem axles may exceed 2,500 pounds. It follows

that adding a number of such values, subject to random variation, will result in a summation at least equally variable. For this reason we do not consider multiple draft weighing an accurate method for determining the gross weight unless all axles are weighed simultaneously. It is, however, a necessary and accurate method for determining the instantaneous load reaction of a single axle.

MR. HANSEN: In Minnesota we have issued a regulation to the effect that multiple-draft weighing is not acceptable for determining the weights of commercial loads. Such a regulation is necessary because our experience has indicated that inaccuracies are probable when weights are determined by this method.

(Mr. Baucom demonstrated on the blackboard the effect of brake application in determining axle loads.)

MR. REZNEK: We had one carrier make a study in which he took a sealed tank truck and had it weighed on 65 certified scales, successively, over a three-day period. The results of these weighings varied on the front axle 1,230 pounds, on the drive axle 2,339 pounds, and on the tandem axles 1,280 pounds. On twelve of the 65 scales, a violation of the weight regulations was indicated. This is a very real problem to all truckers, who realize that their vehicles may be weighed in one place and found legal and then travel a few miles, only to be weighed again and found in violation.

MR. CHRISTIE: In New Jersey our legislature has provided for a 5 percent tolerance on axle overloads. We have noticed that the greatest variations occur in the so-called ten-wheel tandem truck.

MR. KIBBEE: As a representative of the American Trucking Associations, I want to state that the truckers are not complaining, but, on the other hand, are interested in getting down to the root of this problem. We recognize that there is a problem both in wheel and axle-weight determinations. I am very much encouraged that the National Bureau of Standards has instituted this investigation, since, generally speaking, the scales seem to be accurate, but the methods of weighing might be subject to question. Since tolerances are allowed on the devices, perhaps tolerances also should be allowed on the procedures. We have found that variations in axle weights may be caused by merely starting a vehicle or by making a turn. I want to assure this Conference that the American Trucking Associations will be glad to cooperate toward the solution of this problem.

MR. R. W. SEARLES: In Ohio, up until two years ago, we had a maximum axle-weight allowance of 18,000 pounds. On top of that, a 1,000-pound enforcement tolerance was allowed. It appeared that many of the truckers were loading to the full 19,000 pounds, and soon truckers made request to the State legislature that 19,000 pounds be made the legal limit without any stipulated tolerance. With that accomplished, many requests now are being received for a tolerance on top of the 19,000 pounds.

I would contend that it is the responsibility of the individual truckers to see that their loadings are such as to allow for normal variations in axle weights.

MR. CHRISTIE: In New Jersey, only specially trained men are allowed to enforce the axle-weight law. They are permitted to weigh only under certain conditions with loadometers, and, when in doubt,

they move the vehicle to a location where axle weights can be determined on platform scales. These enforcement officials have found that axle loads can be determined with loadometers within 150 pounds if great care is exercised.

MR. KIBBEE: I have found this discussion very enlightening, because I did not realize that such large variations were possible in the weight determination of an axle. I am quite sure that many truckers are not aware of these variations.

REPORT OF THE COMMITTEE ON SPECIFICATIONS AND TOLERANCES, PRESENTED BY R. E. MEEK, CHAIRMAN

The Committee on Specifications and Tolerances of the National Conference on Weights and Measures held no general meetings during the year. On several occasions two or more members of the Committee did take advantage of being together for other purposes to discuss Committee problems. During the month of September 1953 the Committee Chairman and Secretary met with the Committee on Weights and Measures of the American Petroleum Institute to discuss the problem of equipment and methods for testing fluid meters dispensing liquefied petroleum gases. Otherwise, the Committee functioned throughout the year through correspondence among the members and among weights and measures officials and representatives of industry and business.

This report to the 39th National Conference on Weights and Measures represents current Committee conclusions in relation to matters referred to it by the 38th National Conference and to those matters brought to it from other sources.

The tentative report of the Committee was prepared and distributed in advance of the Conference in order to give all interested persons adequate opportunity to study its contents prior to the meeting. The Committee invited comments and suggestions on the subject matter of the report and on any other matters within the purview of the Committee.

The Committee was in open session, preliminary to the preparation of its final report, at the Sheraton-Park Hotel, Washington, D. C., beginning at 10 a. m., Monday, May 17, and continuing until 4:30 p. m.

In accordance with the resolution adopted by the 38th National Conference on Weights and Measures, which expanded the activities of the several standing committees to include the furnishing of necessary leadership in bringing about the official adoption and enforcement of Conference recommendations, your Committee on Specifications and Tolerances has done everything that it considered appropriate to encourage the several States to adopt officially and to enforce the codes of specifications, tolerances, and regulations for commercial weighing and measuring devices previously adopted by the Conference.

The Committee is glad to report that encouraging response was received from several jurisdictions. Some State departments have reported official action during the year, while several others currently are in the process of promulgating these codes. Your Committee realizes that the full cooperation of each State, county, and city department is essential to effectuate efficient and uniform weights and measures administration throughout the United States. The Com-

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Date: Jan 16 2013

Steve Lavin
Chairman of the House Transportation Committee
Montana House of Repesentatives
Helena, MT

Re: House Bill 157

I would like to start by introducing myself. My name is Steve Greyn. I own and operate a company located in Montana. My Company is in the business of selling and servicing scales. I have been servicing and installing scales since June of 1998. Before starting my own business I worked for a large company in the Midwest. I was their lead Tech for approximately 10 years. This experience has brought me to servicing scales on both coasts and consulting into Canada. I have provided tech support to people in Australia, New Zealand, South America, and Africa.

It has recently come to my attention that Montana is considering allowing Split Weighing as an accepted method for measuring commodities. In My opinion this would be a bad idea.

I could write pages and pages of stories that come from disputes or service calls involving Split weighing. I will outline a few.

One Customer had called with the complaint that their scale was weighing off. When we arrived we asked the customer what their problem was they said when they moved their truck it changed the weight 3000 pounds. We then proceeded to test the scale. We could find nothing wrong with the scale. We would move our test load in any given spot on the scale and the scale weighed within twenty pounds. At this point we suggested the customer's problem may be a result of one of the axels not being on the scale. They then informed us that one of the axels were off the scale because they were split weighing. We had them bring their truck in and show us what they were doing. If they moved their truck ahead 10 feet their weight did indeed change 3000 pounds. In the end this customer purchased a scale extension. Their losses were so high they figured they could pay for it in a short time.

Another customer had called and complained their trucks were getting overload tickets. This Customer had trucks driving the nation. They owned a full size vehicle scale and an axel scale similar to what most weigh stations have. The axel scale had 70 foot approaches. We tested both scales and found them weighing within 20 pounds with a 21,000 test load. We then drove our truck on the axel scale. Found that the axel weights on our truck were different about 200 pounds depending on the direction we were facing. We then measured the level of the approaches with a transit. The one approach dropped off 1 inch in 70 feet. The customer was weighing liquid tankers. The Fluid transfer was causing an error of over several thousand

pounds. This was a big enough problem for the customer that they purchased multi-platform scale. This way they could see the weight of all axels in relation to each other.

In conclusion there are a lot of ways that split weighing produces in accurate weights.

Thank you for your time.

Steve Greyn