



NATIONAL TYPE EVALUATION PROGRAM

Certificate of Conformance

for Weighing and Measuring Devices

For:

Weighing/Load Receiving Element
 Vehicle, Modular, Electronic Load Cell
 Model: XXXYYYEPR
 n_{max} : 10 000
 e_{min} : 20 lb
 Capacity: 60 000 to 270 000 lb
 Platform: (see below)
 CLC: 45 ton
 Accuracy Class: III L

***Submitted By: Contact Info. Updated: October 2010**

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Standard Features and Options

- The "XXX" in the model number designation indicates capacity in tons
- The "YYY" in the model number designation indicates platform length in feet
- A "LF" suffix in the model number designation indicates a lower framework for portability
- A "C" suffix in the model number designation indicates a concrete deck. No designation indicates a steel deck
- A "BD" suffix in the model number designation indicates a material dump through option
- A "14" suffix in the model number designation indicates a 14-foot wide deck
- A "A" prefix in the model number designation indicates the use of an analog compression load cell
- A "D" prefix in the model number designation indicates the used of a digital compression load cell. Absence of a "A," "D," or "H" prefix in the model designation indicates the use of a double-ended shear beam load cell.
- A "H" prefix in the model number designation indicates the use of a SST series hydraulic compression load cell.

• Installations must satisfy the relationships of:

Nominal capacity \leq CLC x (N - 0.5), where N = number of sections in the scale, and the actual platform area shall not be less than 50% of the smallest two section (four load cell) module of the device tested. The length of the scale is unrestricted provided that $V_{MIN} \leq e \div \sqrt{N}$ (Where N is the number of load cells in the scale).

- Minimum Module Length: 8.75 feet
- Maximum Distance Between Sections: 30 feet
- Module Widths: 7" to 14" and 7" to 12" for "H," "A" and "D" prefix models
- Deck Material: Steel or Concrete

Load Cells Used:

- Cardinal Scale Manufacturing Company DB series double-ended shear beam (NTEP CC Number 97-133) or
- Cardinal SCA series load cells (NTEP CC Number 89-042) or Cardinal SST series (NTEP CC Number 05-076) or metrologically equivalent load cells that have an active NTEP Certificate of Conformance

Options:

- Steel or Concrete Deck
- Dump Through Deck
- Compression or Beam Load Cells
- Portable with Lower Frame or Permanent Installation Without Lower Frame

Temperature Range: -10 °C to 40 °C (14 °F to 104 °F)

This device was evaluated under the National Type Evaluation Program and was found to comply with the applicable technical requirements of "NIST Handbook 44: Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices." Evaluation results and device characteristics necessary for inspection and use in commerce are on the following pages. *Editorial changes, not affecting the type or metrological content, corrected this certificate.

Tim Tyson
 Chairman, NCWM, Inc.

Randy Jennings
 Chairman, National Type Evaluation Program Committee
 Issued: October 21, 2010

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Cardinal Scale Manufacturing Co.

Weighing/Load Receiving Element / XXXYYYEPR

Application: General-purpose vehicle weighing applications when connected to an NTEP Certified and compatible indicating element.

Identification: The identification information is stamped on a metal badge that is riveted to the side of the weighbridge.

Sealing: Load cell adjustments are made in the load cell junction boxes and may be secured with a wire security seal. Overall calibration adjustments are sealed per the sealing method found on the approved indicating element's Certificate of Conformance.

Operation: The device is designed to be used with the vehicle in a static (stopped) condition.

Test Conditions: This Certificate supersedes Certificate of Conformance No. 97-093A4 and is issued to add the optional use of compression load cells. A Model A3570EPR scale with a 70 ft x 11 ft platform using ten Cardinal model 50K-SCA compression load cells (NTEP Certificate of Conformance Number 89-042) was submitted for evaluation (200 000 lb x 20 lb, five section, 70 ft x 11 ft, 40 ton CLC). The scale was furnished with a steel deck. The scale was interfaced with a Cardinal Model 220 indicator (NTEP Certificate of Conformance Number 01-011A1). The scale was tested using 72 000 lbs of known test weights to perform increasing/decreasing load and shift tests. The 72 000 lbs of weights were also used to perform mid-span tests. A strain load test was conducted using 72 000 lbs of known test weights to a maximum of 160 000 lbs. The conditions for the previous certificates are listed below for reference.

Certificate of Conformance Number 97-093A4: This Certificate supersedes Certificate of Conformance No. 97-093A3 and is issued to add scale models with concentrated load capacities (CLC) of 45 tons (90,000 lb), module widths up to 14 ft. and a dump through deck option. A Model 10070EPR scale with a deck width of 14 feet was submitted for evaluation (200 000 lb x 20 lb, five section, 70 ft. x 14 ft., 45 ton CLC). The scale was furnished with one concrete deck module with the remainder of the modules furnished with steel decks, one equipped with a dump through option. The scale was interfaced with a Cardinal Model 220 indicator (Certificate of Conformance Number 01-011A1). The scale was initially tested using 81 000 lbs of known test weights to perform increasing/decreasing load, mid span, position, side loading and shift tests. A strain load test was conducted using 81 000 lbs of known test weights to a maximum of 160 000 lbs. The device was sealed for permanence. The scale was used for 40 days with minimum use criteria required by NTEP being met and retested. The increasing/decreasing load, shift, mid-span and position tests were repeated using 81 000 lb of known test weights. A strain load test was again conducted to a maximum load of 160 000 lbs. The conditions for the previous certificates are listed below for reference.

Certificate of Conformance Number 97-093A3: This certificate supersedes Certificate of Conformance (CC) No. 97-093A2 and is issued to add scale models with concentrated load capacities (CLC) of 40 tons (80 000 lb). A Model 10070EPR scale was submitted for evaluation (200 000 lb x 20 lb, four section, 70 ft. x 11 ft., 40 ton CLC). The scale was furnished with one concrete deck module with the remainder of the modules furnished with steel decks. The scale was interfaced with a Cardinal Model 778 indicator (Certificate of Conformance Number 97-077A1). The scale was initially tested using 72 000 lbs of known test weights to perform increasing/decreasing load and shift tests. The 72 000 lbs of weights were also used to perform mid-span tests. A strain load test was conducted using 72 000 lbs of known test weights to a maximum of 160 000 lbs. The conditions for the previous certificates are listed below for reference.

Certificate of Conformance Number 97-093A2: This certificate supersedes Certificate of Conformance No. 97-093A1 and is issued to add a concrete deck option. A model 10070EPR-C scale was submitted for evaluation (200 000 lb x 20 lb, four section, 70 ft. x 10 ft., 30 ton CLC). The scale was interfaced with a Cardinal Model 738 indicator (Certificate of Conformance Number 86-035A3). The scale was initially tested using 54 000 lbs of known test weights to perform increasing/decreasing load and shift tests. The 54 000 lbs of weights were also used to perform mid-span tests. A strain load test was conducted using 54 000 lbs of known test weights to a maximum of 160 000 lbs. The conditions for the previous certificate are listed below for reference.

Certificate of Conformance Number 97-093A1: This certificate superseded Certificate of Conformance Number 97-093 and was issued without additional testing to allow the load receiving element to be permanently installed without a lower frame or used as a portable load receiving element with a lower frame and to change the load cells. The portable version will be identified with the letters "LF" for the lower frame in the option section of the load receiving element identification plate.



Cardinal Scale Manufacturing Co.

Weighing/Load Receiving Element / XXXYYYEPR

Certificate of Conformance Number 97-093: The emphasis of the evaluation was on the design, marking, and performance of the weighing element and load receiving element. A Model 10070EPR scale was submitted for evaluation (200 000 lb x 20 lb, four section, 70 ft x 10 ft, 35 ton CLC). The scale was interfaced with a Cardinal Model 738 (Certificate of Conformance Number 86-035A3). The scale was initially tested using 63 000 lbs of known test weights to perform increasing/decreasing load and shift tests. The 63 000 lbs was also used to perform mid-span tests. A strain load test was conducted using 63 000 lbs of known test weights to a maximum load of 160 000 lbs. The scale was used for more than three months with minimum use criteria required by NTEP being met and retested. The increasing/decreasing load, shift and mid-span tests were repeated using 40 000 lbs of known test weights. A strain load test was again conducted to a maximum load of 133 000 lbs.

Evaluated By: Charles Stutesman (KS), Todd Lucas (OH), 97-093A4; Terry Davis (KS), Milton Carlin (KS) 97-093A5

Type Evaluation Criteria Used: NIST, Handbook 44: Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices, 2005. NCWM, Publication 14: Weighing Devices, 2005.

Conclusion: The results of the evaluation and information provided by the manufacturer indicate the device complies with applicable requirements.

Information Reviewed By: S. Patoray, L. Bernetich (NCWM) 97-093A4, 97-093A5

Examples of Device:



Compression Load Cell Mounting (other load cell mounting available)



Model XXXYYYEPR Scale