Telescopic Boom Length Indicating System—SAE J1180

SAE Recommended Practice
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TELESCOPIC BOOM LENGTH INDICATING SYSTEM—SAE J1180

SAE Recommended Practice

Report of Construction and Industrial Machinery Technical Committee approved March 1977. Rationale statement available.

1. Scope—This SAE Recommended Practice applies to mobile cranes when used in lifting crane service which are equipped with boom length indicating devices.

2. Purpose—The purpose of this Recommended Practice is to establish the minimum performance requirements of systems which measure and display to the operator, or other responsible persons, the boom length at which a load is being lifted by cranes with variable length, telescopic booms.

3. Definition

3.1 Boom Length—Boom length is the straight line thru the centerline of boom pivot pin to the centerline of the boom point load hoist sheave pin, measured along the longitudinal axis of the boom.

3.2 Boom Length Indicating System—A boom length indicating device applied to a crane which measures and displays the length of a variable length, telescopic boom.

4. Minimum Performance Requirements

4.1 Accuracy—The tolerance range for the indicated length shall be ±2% of the actual boom length.

4.2 Temperature Effect—Specified accuracy shall be maintained over ambient temperature variations of -30–50°C (-22–122°F) without external adjustment.

4.3 Readout

4.3.1 The device readout should be in units of measure which are compatible with the appropriate load rating chart for the crane. Minimum resolution shall permit the clear indication of values within the accuracy requirements of the system, under all conditions of operation.

4.3.2 The device readout shall be located so that the operator or other responsible persons can obtain readings from his normal operating position and its location shall not create an operational hazard.

4.4 Set Points—Boom length indicating systems may be equipped with manually adjustable working range set points having a visual or audible warning signal. When so equipped, visual signals shall be clearly visible and audible signals must be clearly distinguishable above the noise of engines and machinery.

4.5 Operation Check—The system shall have a means for the operator or other responsible persons to determine that it is operative prior to use.

4.6 Testing—The boom length indicating system shall be performance tested by the installer initially and by the user at recommended intervals, or at any time there is an indication of inaccuracy. (See accuracy requirements in paragraph 4.1 and testing procedure in Section 6.)

5. General Requirements

5.1 Installation and Maintenance—Installation and maintenance of the length indicating device and maintenance of the crane should be in accordance with the manufacturer's recommendations to assure system accuracy.

5.2 Labeling—Labels shall be conspicuously placed on the device readout or in the operator's cab or both, giving the following information:

5.2.1 Units of measure.

5.2.2 Maximum capacity of the boom length indicating system.

5.2.3 Operating range of the indicating system for which the accuracy requirement of paragraph 4.1 is met.

5.2.4 Basic operating instructions and precautions.

5.2.5 Manufacturer's name, address, and device model number.

5.2.6 Statement of compliance with SAE Recommended Practice J-XXX (insert appropriate number and revision letter).

5.3 Manual—An operation, installation, and service manual(s) shall be provided by the manufacturer and shall be available to the operator or other responsible persons at all times.

6. Performance Evaluation Tests

6.1 General testing requirements:

6.1.1 Specific test instructions for the device shall be provided by the manufacturer.

6.1.2 Test personnel shall be thoroughly familiar with manufacturers' manuals for the system and shall check system for all functions.

6.1.3 All required equipment shall be on hand prior to start of test.

6.1.4 For system calibration, three or more test lengths shall be employed to establish compliance with paragraph 4.1. Test lengths shall be as near as is practical to the minimum, mean, and maximum operating range.

6.1.5 For periodic calibration checks, two or more test lengths shall be employed.

6.2 Test procedures shall include the method described below or equivalent:

6.2.1 Measure length by means of a steel tape in accordance with paragraph 3.1. Compare the measured length to the indicated length. System accuracy shall be within the tolerance of paragraph 4.1.

6.3 Test Data

6.3.1 Test forms shall include, but not be limited to, the following information:

a) Owner(s).
b) Crane manufacturer, model, serial number.
c) Device manufacturer, model, serial number.
d) Crane configuration at time of test, method of test, and test readings.
e) A statement that the system met (did not meet) the accuracy requirement of paragraph 4.1 or that recalibration was necessary in order to achieve accuracy. The system accuracy calculation shall be part of this report.

6.3.2 All test records shall be signed and dated. A copy of the current test record shall be available at all times.

6.4 Computations—The system accuracy shall be determined from the following formula:

Measured length minus (-) indicated length ≤ 0.02 times the actual boom length.