



SURFACE VEHICLE STANDARD	J765™	JUN2017
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Superseding J765 OCT1990		
Crane Load Stability Test Code		

RATIONALE

This document has been revised to include recommended test conditions (8.3) and to include several editorial changes.

1. SCOPE

This SAE Standard may be used for all revolving cranes wherein the capacity of the crane to support loads is based on its resistance to overturning. It is not applicable to cranes wherein the capacity of the crane is based on factors other than stability.

1.1 Purpose

The purpose of this test is to determine the maximum capacity of a crane to counterbalance loads applied on its hook. The capacity of the crane is reported in terms of the load in kg (pounds) and its corresponding radius in m (feet) for a specified position of the upper structure with respect to the mounting.

2. REFERENCES

There are no referenced publications specified herein.

3. DEFINITIONS

3.1 BALANCE POINT

The condition of crane loading wherein the load moment acting to overturn the crane is equal to the maximum moment of the crane available to resist overturning. On wheel mounted cranes where balance loads are supported over an end of the mounting equipped with free-oscillating dual axles, the balance point, without outriggers set, is determined with the oscillating center of the axles or "bogie axle" functioning as the fulcrum.

3.2 AXIS OF ROTATION

A vertical line through the axis around which the crane upper structure rotates, before load is applied to the crane hook.

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3.3 LOAD

The force acting to unbalance a crane; it results from the gravitational force created by the hook and all items suspended from the hook.

3.4 RADIUS OF LOAD

The horizontal distance from a projection of the axis of rotation to the supporting surface, before loading, to the center of vertical hoist line or tackle with load applied.

3.5 SPECIFIED

The term specified, where used herein, is construed to mean the recommendation of the manufacturer, the user, the testing entity or any agreement between these parties.

4. LIMITATIONS

These test methods should be used only for those load ratings which are based on stability factors and are not applicable to those ratings which are based on other factors. The testing entity should take care to assure that tests are made only in the least stable direction for the rating under test. The least stable direction may be determined by calculation.

5. METHODS

The load is applied by freely suspending weight of predetermined magnitude and adjusting its position horizontally.

6. FACILITIES

6.1 Apparatus and Materials

- 6.1.1 A concrete or other firm supporting surface of sufficient size to provide for unobstructed accomplishment of the tests required.
- 6.1.2 Means for determining the load radius to an accuracy of $\pm 1\%$, not to exceed 0.15 m (6 inches).
- 6.1.3 Means to measure tire pressure to an accuracy of $\pm 3\%$ of measured pressure.
- 6.1.4 Means for projecting the crane axis of rotation to the test course surface.
- 6.1.5 Means for measuring the horizontal distance from the axis of rotation to the center of gravity of the load.
- 6.1.6 Means for determining the weight of test weights, hook block slings, and other auxiliary equipment: accuracy $\pm 1/2\%$ of measured load.
- 6.1.7 Test weights and lifting apparatus of known weight, accurate to within $\pm 1\%$.

7. PROCEDURE

7.1 Set Up

7.1.1 Service and adjust the crane as applicable to assure manufacturer's specified conditions of:

- a. Lubrication
- b. Fuel supply
- c. Tire inflation
- d. Coolant supply
- e. Track tension
- f. Bolts, pins, cable fittings, and other load bearing components
- g. Clutches, brakes, and other power transmission components
- h. Boom length and rigging
- i. Crane level to within a 1% grade

7.1.2 Operate the crane under partial load to assure operator proficiency and proper machine function. In the absence of specific recommendations, a new machine should be operated for at least 4 hours. Service and adjust the machine to specified tolerances at the conclusion of this initial operation.

7.1.3 Locate the crane on the test course in position for loading and lock the travel brakes.

7.1.4 Set outriggers, if used, and jack the crane to a position where the tires or tracks within the boundary of the outriggers are unloaded.

7.1.5 Vertically project the upper structure axis-of-rotation to the surface of the test course and mark its location.

7.2 Test Methods

7.2.1 Prepare test load including test weights, hook block, slings, and other auxiliary equipment, such as load basket, that make up the specified load weight within $\pm 1\%$. Record this value.

7.2.2 With the crane upper structure in the specified position, hoist the load free of the test surface at a radius where the crane is stable; then boom down a small amount to increase the radius. Keep the load as close as possible (approximately within 0.3 m (12 inches)) to the test surface at all times to prevent excessive tipping. If the crane will support the load at the adjusted radius, measure and record the new radius. Repeat the procedure until the balance point is reached. The balance point on outriggers is exceeded when the radius continues to increase with no corresponding boom movement. The final adjustment of the balance point may be made by adding small increments of weight rather than increasing the radius. When the balance point is reached, the load and radius of the crane shall be recorded.

7.2.3 Alternately measure the radius of load and add small increments to the load until the load overcomes the stability of the crane. The radius of load and load weight last obtained, before the load overcame the stability of the crane, shall be recorded as the balance point condition.

7.2.4 Wind direction should be such that it does not increase the stability of the crane.