

SAENORM.COM : Click to view the full PDF of J765a_196902

CRANE LOAD STABILITY TEST CODE—SAE J765a

SAE Recommended Practice

Report of Construction and Industrial Machinery Technical Committee approved April 1961 and last revised February 1969.

1. Purpose—The purpose of this test is to determine the maximum capacity of a crane to counterbalance loads applied on its hook block. The capacity of the crane is reported in terms of the load in pounds and its corresponding radius in feet for a specified position of the superstructure with respect to the mounting.

2. Scope—This test 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 structural strength or available hoisting power.

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 "bogic axle" functioning as the fulcrum.

3.2 Axis of Rotation—A vertical line thru the axis around which the crane superstructure rotates, before load is applied to the crane hook.

3.3 Load—The force acting to unbalance a crane; it results from (1) the gravitational force created by hook block and all items suspended from the hook block; (2) force exerted by hoisting on a fixed anchor; or (3) a combination of the above forces.

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 agency 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 structural competence. The testor should take care to assure that tests are made only in the least stable direction for the rating under test.

5. Methods—Two methods for conducting these tests are covered. In the first, the load is applied by suspending a weight of predetermined magnitude and adjusting its position horizontally to the balance point. In the second, the load is applied by hoisting on a fixed anchor and adjusting the hoisting force and boom so that the hoist line is vertical while the force necessary to bring the crane to the balance point is applied to the hoist line.

6. Facilities—Apparatus and Materials.

6.1 Facilities common to both suspended-load and anchor-load

methods:

6.1.1 A concrete or other firm supporting surface, level within $\pm 1\%$ of grade.

6.1.2 Steel tape.

6.1.3 Tire pressure gage; accuracy $\pm 3\%$ 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.

6.2 Facilities necessary for the suspended-load method only:

6.2.1 Test weights, as required to make-up specified loads, and to provide additional load in ten pound increments.

6.3 Facilities necessary for the anchor-load method only:

6.3.1 Means for measuring the force in pounds exerted by the hoist line on the hoisting anchor; accuracy $\pm 1/2\%$ of the force measured.

6.3.2 Means for determining that hoisting lines are vertical.

7. Procedure

7.1 Common to both suspended-load and anchor-load methods:

7.1.1 Service and adjust the crane as applicable to assure 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.

7.1.2 Operate the crane under partial load sufficiently long to assure operator proficiency and proper machine function. In the absence of specific recommendations, a new machine should be operated for at least four hours. Service and adjust the machine to specified tolerances at conclusion of the "Limbering-Up" 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 superstructure axis-of-rotation to the surface of the test course and mark its location.

7.2 Procedure for suspended loads:

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 superstructure in the specified position, hoist the load free of the test course at a radius where the crane is stable; then, boom the load out to a radius near the balance point.

NOTE: The load should be kept near the test course surface in order to avoid excessive tipping of the crane. Also, the crane should be safeguarded—by blocking or other means—from overturning backward should the load line or other tackle fail while under load.

7.2.3 Alternately measure the radius of load and add a ten pound increment 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.

7.3 Procedure for anchor-load method:

7.3.1 Determine the weight of the hook block and any part of the force measuring means that will be suspended by the hook block. Record these values.

7.3.2 Install the force measuring means between the hook and anchor

7.3.3 With the crane in the specified position for lift and with the load line kept vertical while under load:

(a) Apply hoisting force to the anchor until the indicated magnitude of force tends to diminish with continued hoisting.

(b) Record the observed hoisting force and the radius of load. The peak hoisting force in pounds plus the weight of the hook block and other equipment suspended between the hook block and anchor constitutes the load for record.

8. Computations and Records

8.1 Capacity Curve—Where it is desired to determine the balance point capacity of a crane throughout a range of loads or radii, follow

CRANE LOAD STABILITY TEST SUMMARY

Testing Agency _____ Location _____

Make _____ Model _____ Serial No. _____

Condition: New _____ Used _____ Hours _____

Mounting Type _____ Size _____

Tires: Size _____ Ply _____ Pressure (psi) _____

Booms Type _____ Length (ft) _____

Boom Jib: Type _____ Length (ft) _____ Angle to the Boom _____

Engine: Make _____ Model _____ Serial No. _____

Counterweights Type _____ lb _____

Test Method: Suspended Weights _____ Anchor _____

BALANCE POINTS

Position of Superstructure	Without Outriggers		With Outriggers	
	Load (lb)	Radius (ft)	Load (lb)	Radius (ft)

Remarks _____

Test Engineer: _____ Date of Test: _____

FIG. 1—PAGE 1 OF TEST SUMMARY