CRANE LOAD STABILITY TEST CODE—SAE J765

SAE Recommended Practice

Report of Construction and Industrial Machinery Technical Committee approved April 1961.

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 "bogieaxle" 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—It is critically important that the manufacturer's maximum permissible load and radius limitations are not exceeded since these limitations are frequently based on structural strength rather than resistance to overturning. In no case should users of this code perform balance capacity lifts with the load supported on one outrigger or support point because of the structural limitations and safety hazards involved.

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 ± 1% of grade.

6.1.2 Steel tape.

6.1.3 Tire pressure gage; accuracy ± 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 ± ½% 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 ± ½% 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.

CRANE LOAD STABILITY TEST SUMMARY

Testing Agency_____ Location_____

Make_____ Model_____ Serial No._____

Condition: New_____ Used_____ Hours_____

Mounting: Type_____ Size_____

Tires: Size_____ Ply_____ Pressure (psi)_____

Boom: Type_____ Length (ft)_____

Boom Jib: Type_____ Length (ft)_____ Angle to the Boom_____

Engine: Make_____ Model_____ Serial No._____

Counterweight: 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

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 ± 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,