The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

SURFACE VEHICLE STANDARD

SAE J765 | REV. OCT90

Issued 1961-04
Revised 1990-10

Superseding J765 OCT80

An American National Standard

(R) CRANE LOAD STABILITY TEST CODE

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 structural strength or available hoisting power.

1.1 **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 kilograms (pounds) and its corresponding radius in meters (feet) for a specified position of the upperstructure with respect to the mounting.

2. ***References***

2.1 **Applicable Publications—**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 upperstructure rotates, before load is applied to the crane hook.

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

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 tester should take care to assure that tests are made only in the least stable direction for the rating under test.

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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, sufficiently large to provide for unobstructed accomplishment of the tests required.

6.1.2 Means for determining the load radius to an accuracy of ±1%, not to exceed 0.15 m (6 in).

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 ±1/2% of measured load.

6.1.7 Test weights and lifting apparatus of known weight, accurate to within ±1%.

7. Procedure

7.1 Set Up

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
i. Crane level to within a 1% grade

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 4 h. Service and adjust the machine to specified tolerances at 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 upperstructure 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 ±1%. Record this value.

7.2.2 With the crane upperstructure in the specified position, hoist the load free of test surface at a radius where the crane is stable; then boom down a small amount to increase the radius. Keep the load within 0.1 m (3.9in) of 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 a 10 lb 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.

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

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 procedures as outlined for individual determinations, making sure that load and radius are determined for each extreme of the range and at a sufficient number of intermediate points to permit plotting a curve. Plot a curve showing the maximum capacity of the crane with the load in kilograms (pounds) as ordinate and radii in meters (feet) as abscissa. Use a representative number of boom lengths for a given capacity chart.

8.2 Test Records—Record a description of the crane, positions for test, load data, and radius of load data on the Physical Dimensions Test Summary sheets Figure 1, Figure 2, and Figure 3.

CRANE LOAD STABILITY
TEST SUMMARY

Testing Agency _____ Location _____

Make _____ Model _____ Serial No. _____

Condition: New _____ Used _____ Hours _____

Mounting: Type _____ Size _____

Tire: Size _____ Ply _____ Pressure (PSI) _____

Boom: Type _____ Length (Ft.) _____

Boom Jib: Type _____ Length (Ft.) _____ Angle to Boom _____

Engine: Make _____ Model _____ Serial No. _____

Counterweight: Type _____ Lb. _____

Test Method: Suspended Weights _____ Anchor _____

BALANCE POINTS

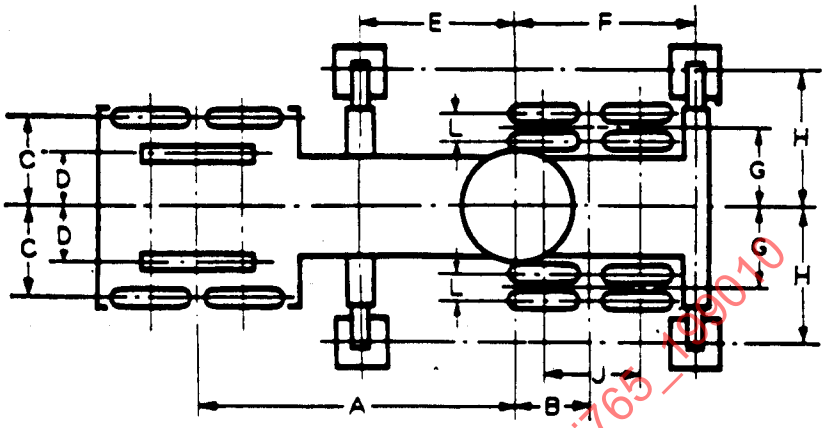
POSITION OF SUPERSTRUCTURE	WITHOUT OUTRIGGERS		WITH OUTRIGGERS	
	Load (Lb.)	Radius (Ft.)	Load (Lb.)	Radius (Ft.)

Remarks:

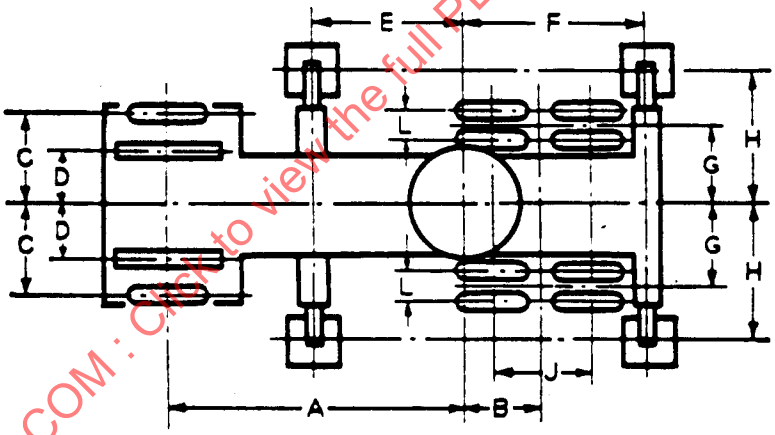
Test Engineer _____ Date of Test _____

FIGURE 1—PAGE 1 OF TEST SUMMARY

PHYSICAL DIMENSIONS TEST SUMMARY



8 X 4 TRUCK



6 X 4 TRUCK

TRUCK MOUNTED

A _____ B _____ C _____

D _____ E _____ F _____

G _____ H _____ J _____

K _____ L _____

Diagrams shown are examples,
actual configuration may vary.

FIGURE 2—PAGE 2 OF TEST SUMMARY

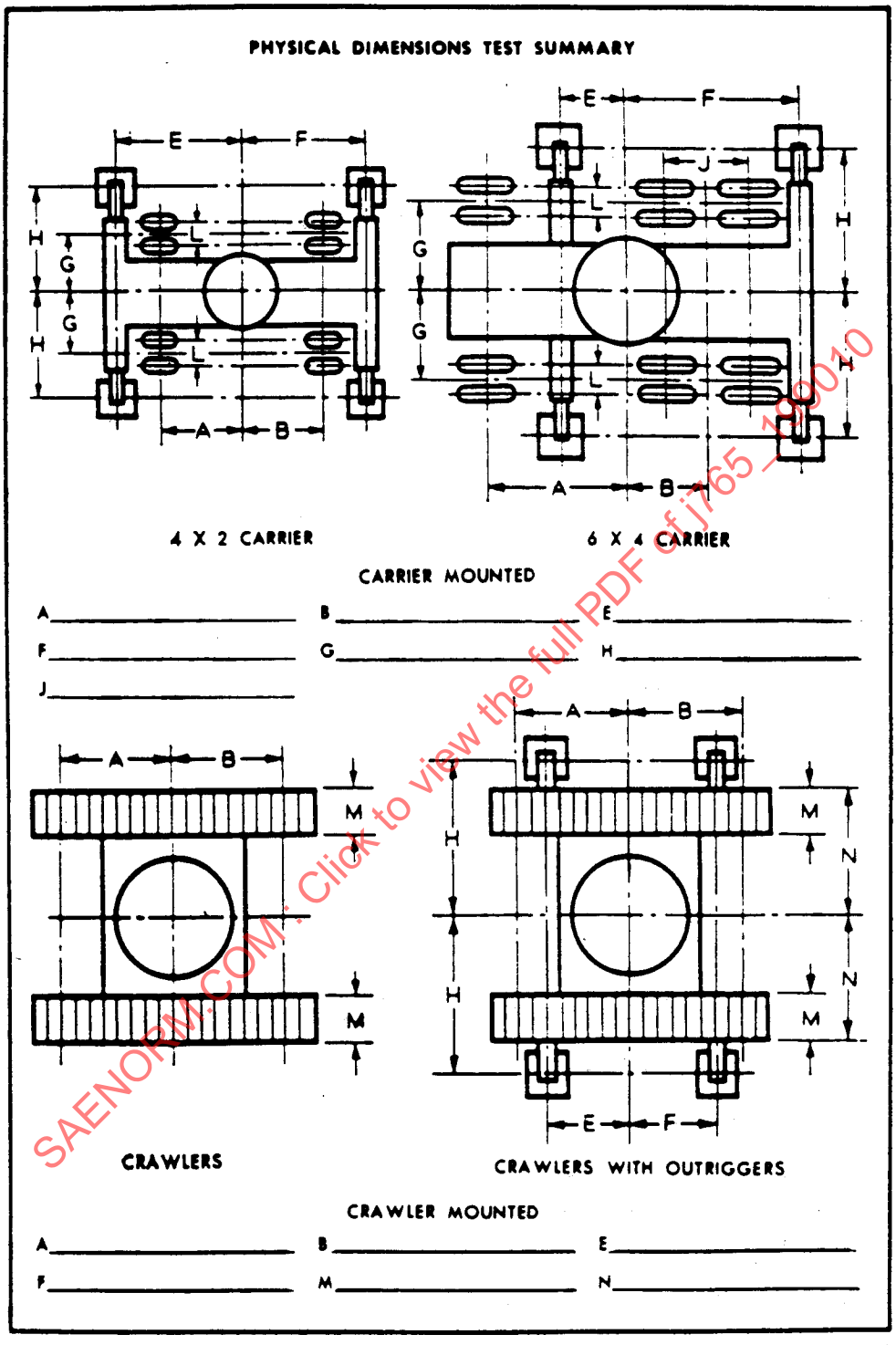


FIGURE 3—PAGE 3 OF TEST SUMMARY