Excavator Hoe Bucket Rating —SAE J296

SAE Standard
Editorial change March 1977

THIS IS A PREPRINT AND WILL
APPEAR IN THE NEXT EDITION
OF THE SAE HANDBOOK

Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

LAND
SEA
AIR
SPACE

PREPRINT

∅ EXCAVATOR HOE BUCKET RATING—SAE J296 SAE Standard

Report of Construction and Industrial Machinery Technical Committee approved June 1972. Editorial change March 1977.

1. Purpose—The purpose of this standard is to provide a uniform method for determining the SAE rated capacity and struck capacity for hoe buckets. The calculations are based on the inside physical dimensions of the bucket only, without use of optional side cutters, spill guards, teeth, or other accessories and without regard to bucket action provided by any specific machine.

2. Scope—This standard applies to hoe buckets on all excavators with a hoe attachment.

3. Definitions

3.1 SAE struck capacity is the volume of the bucket after it has been struck at the strike plane. The strike plane shall pass through the top back edge of the bucket and the cutting edge. (See Fig. 1.)

Variance (whether angular or curved protrusions) of side plates leading edge beyond the strike plane, dimension C_1, shall not be used to increase volume V_S beyond the strike plane. Volume V_S shall be that bounded by the strike plane and the inside contour of the bucket. If the bucket is open between the mounting holes, this opening shall not be a factor in determining the volume. (See Fig. 1.)

Variance (whether angular or curved indentations) of the side leading edge from the strike plane, dimension C_2, should be no greater than D/12 for the purpose of calculating capacity where "D" represents the bucket opening. (See Fig. 1.)

If dimension C_2 is greater than D/12, the volume V_S must be calculated by using the actual volume of the bucket when it has been struck across the strike surface. (See Fig. 2.)

3.2 SAE rated capacity is the sum of the SAE struck capacity and the material heaped on the bucket at a 1:1 angle of repose. (See Figs. 1 and 2.) This in no way implies that the hoe must carry the bucket oriented in this attitude, or that all material will naturally have a 1:1 angle of repose.

$$V_R = V_S + V_E$$

3.3 Definitions of terms used in the equations:

V_S = SAE struck capacity

V_R = SAE rated capacity

V_E = excess material heaped at 1:1 angle of repose

D = bucket opening

3.4 SAE struck capacity shall be according to the following table:

Range of Rated Sizes		Increments	
English	Metric	English	Metric
Under 7 ft^3	Under 0.2m^3	0.5 ft^3	0.01m^3
7 ft^3 up to 0.5 yd^3	0.2 up to 0.4 m^3	1 ft^3	0.02 m^3
0.5 up to 3 yd^3	0.4 up to 2.3 m^3	0.125 yd^3	0.1 m^3
3 yd^3 and over	2.3 m^3 and over	0.25 yd^3	0.2 m^3

The SAE rated capacity shall be in the same range of rated sizes and increments as for the SAE struck capacity.

If the calculated capacity falls below a rated size by more than 2%, use the next lower rated size.

4. Width—When bucket width is specified, both a "bucket width" and a "cutting width" should be stated.

4.1 The "bucket width" is measured over the sides of the bucket at the lower lip without teeth or side cutters attached. (See W_B, Fig. 3.)

4.2 The "cutting width" is measured over the teeth or side cutters. (See W_C, Fig. 3.)

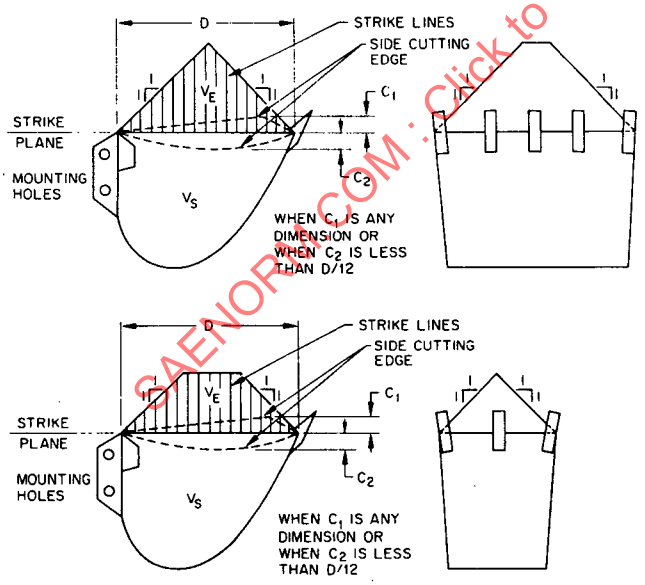

FIG. 1– BUCKET CAPACITY, TYPE A

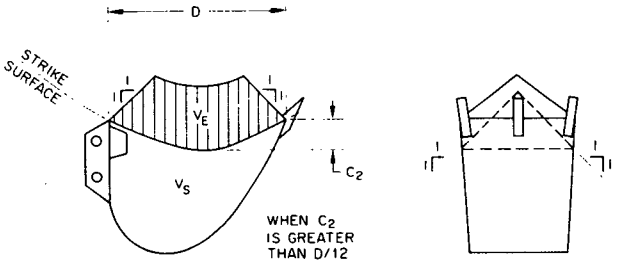

FIG. 2– BUCKET CAPACITY, TYPE B

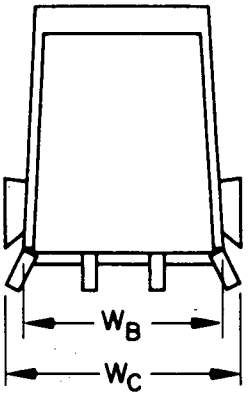

FIG. 3– BUCKET WIDTH