

Specification Definitions — Hydraulic Backhoes — SAE J49

SAE Standard
Editorial change May 1978

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Society of Automotive Engineers, Inc.
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SPECIFICATION DEFINITIONS—HYDRAULIC BACKHOES—SAE J49 SAE Standard

Report of Construction and Industrial Machinery Technical Committee approved January 1973. Editorial change May 1978.

1. Purpose—The purpose of this standard is to establish a uniform method of providing dimensional and operational specifications for hydraulic backhoes.

2. Scope

2.1 This standard includes the definitions of specification most commonly used to describe nonfull-rotating hydraulic backhoes.

2.2 Dimensional and operational specifications are to be determined without assembly or equipment changes such as buckets, dippersticks, etc. When specifications are affected by adjustable or extendable members, the position must be specified. Paragraphs 4.2.1–6.2 are further defined by Figs. 1–8. Figs. 1–8 are not intended to be descriptive of any existing machine and are used only to clarify the meaning of the standard.

3. Specifications—General

3.1 Model Designation—Manufacturer's model number for the backhoe specified.

3.2 Type of Backhoe—Integral backhoe, a backhoe which is an integral part of a prime mover; utility backhoe, a backhoe which is not an integral part of the prime mover.

3.3 Prime Mover Model—For utility backhoes, state the manufacturer's model number on which the specifications are based.

3.4 Loader—State whether the unit is equipped with a loader, and if so, give manufacturer's model number of the loader. Specify type and size of loader bucket.

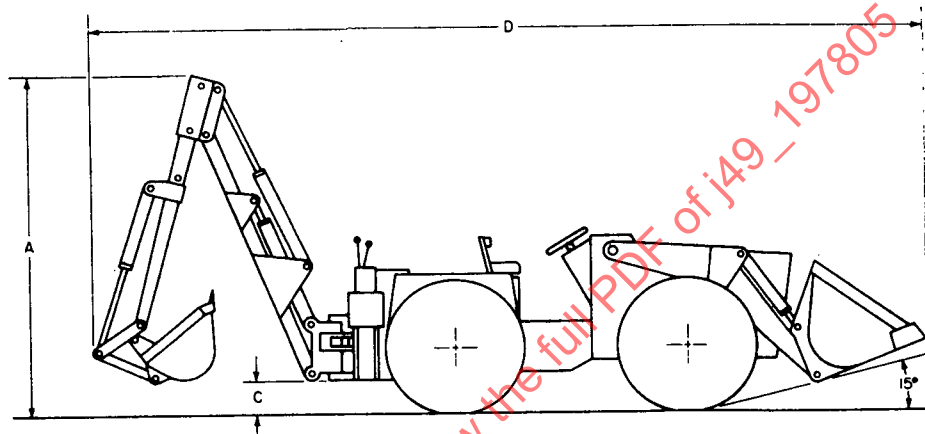


FIG. 1—TRANSPORT POSITION OF INTEGRAL BACKHOE WITH EXTENDABLE DIPPERSTICK

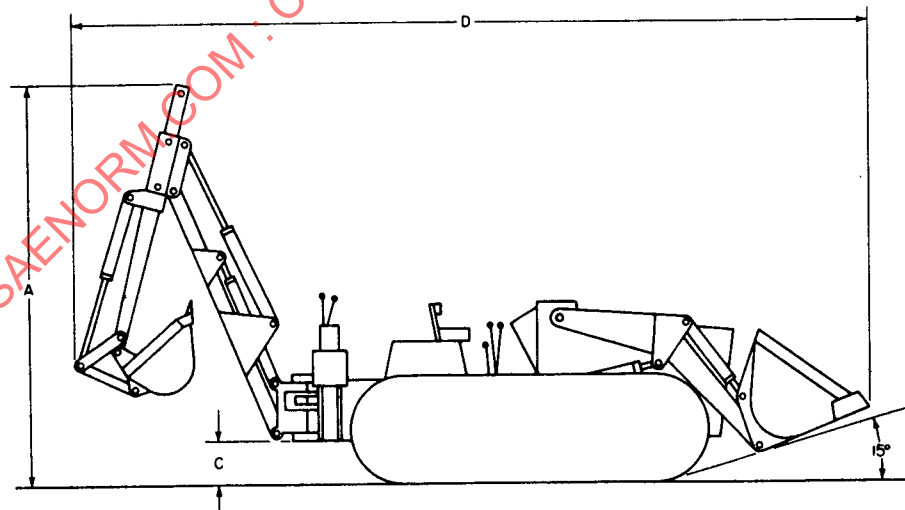


FIG. 2—TRANSPORT POSITION OF CRAWLER BACKHOE WITH EXTENDABLE DIPPERSTICK

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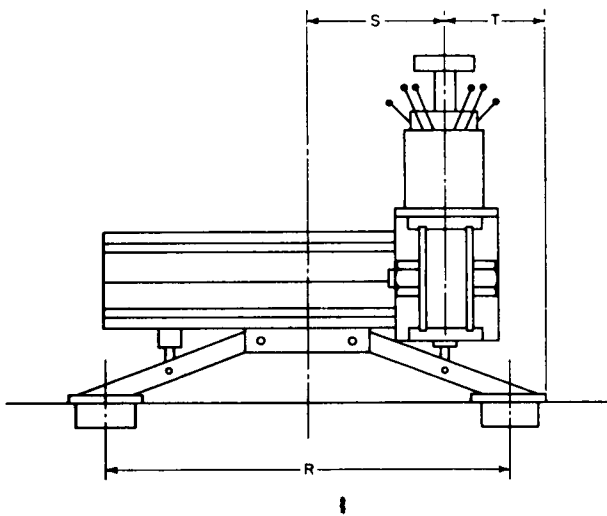


FIG. 3—OPERATIONAL POSITION OF UTILITY BACKHOE, SIDE SHIFT

3.5 Tire or Track—State the track shoe type and width in millimetres (inches) or the tire type size, ply and specified tire inflation pressure; where the front and rear tires are different, both must be specified.

3.6 Tread or Track Gage—The transverse distance in millimetres (inches) between the centerlines of the tires or sprockets; where front and rear treads are different, both must be specified.

3.7 Wheelbase—As specified in SAE J1234.

3.8 Bucket—Specify type, weight (kilograms, pounds), cutting width (millimetres, inches) and capacity per SAE J296.

3.9 Counterweight—Specify type and amount (kilograms, pounds) of counterweight and/or ballast, if any.

3.10 Extendable Dipperstick—If dipperstick is extendable, specify:

TYPE—Telescoping, additional member, sliding collar or other.

METHOD OF EXTENSION—Hydraulic or manual.

EXTENSION—Minimum and maximum extension and number of intermediate positions available.

4. Specifications—Dimensional

4.1 General—All applicable measurements to be made at bucket teeth, unless otherwise specified. Directional references in the specifications are to be in accordance with SAE J326. When the unit is equipped with an extendable dipperstick, indicate the position of the dipperstick used for this specification.

4.2 Transport—These dimensions are to be taken with all components in the transport position. Transport position is to be defined by the manufacturer.

4.2.1 Transport Height (A)—The vertical distance in millimetres (inches) from the ground to the highest point on the backhoe vehicle, or prime mover.

4.2.2 Stabilizer Spread Transport (B)—The distance in millimetres (inches) between the farthest points of the stabilizer assemblies.

4.2.3 Ground Clearance (C)—The minimum vertical distance in millimetres (inches) from the ground to lowest point on the backhoe or vehicle per SAE J1234.

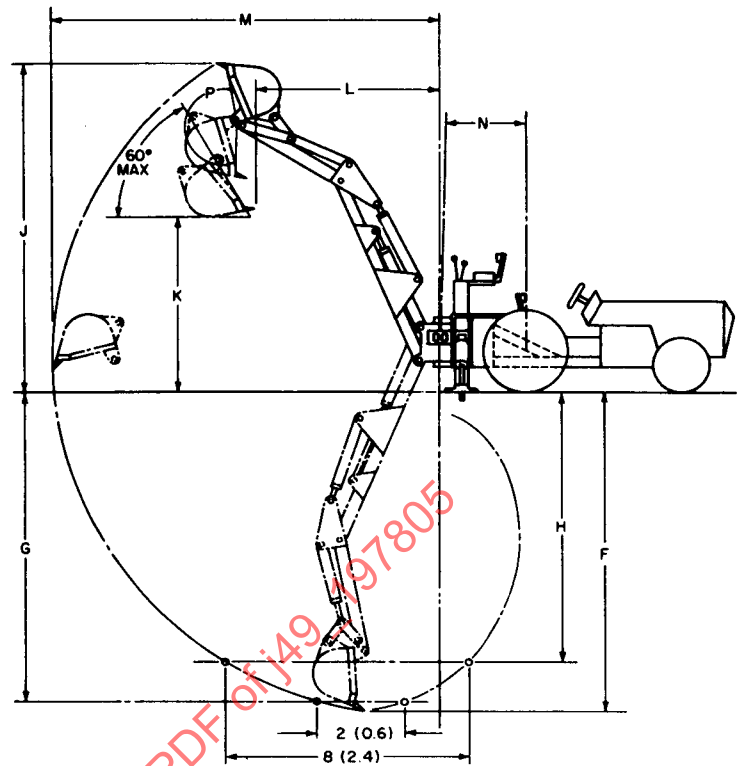
4.2.4 Angle of Departure—As specified in SAE J1234.

4.2.5 Overall Length (D)—The horizontal distance in millimetres (inches) with loader bucket, if so equipped, at carry position as specified in SAE J732.

4.2.6 Overall Width (E)—The maximum outside width in millimetres (inches) of the backhoe or vehicle.

4.2.7 Operating Weight—The total weight in kilograms (pounds) of unit as specified, fully serviced, and including a full fuel tank and an 80 kg (175 lb) operator.

4.2.8 Weight Distribution (Wheeled Vehicle)—Front and rear wheel reactions of the unit as specified in paragraph 4.2.7.



NOTE: DIMENSIONS ARE FT (m)

FIG. 4—OPERATIONAL POSITION OF UTILITY BACKHOE

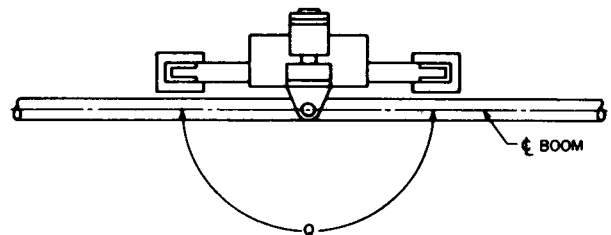


FIG. 5—SWING ARC

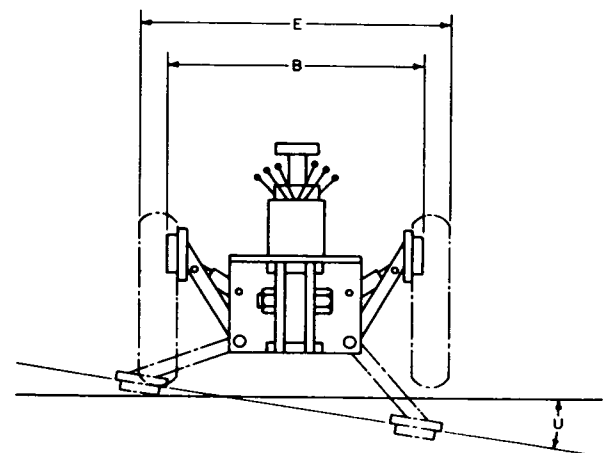


FIG. 6—STABILIZER POSITIONS

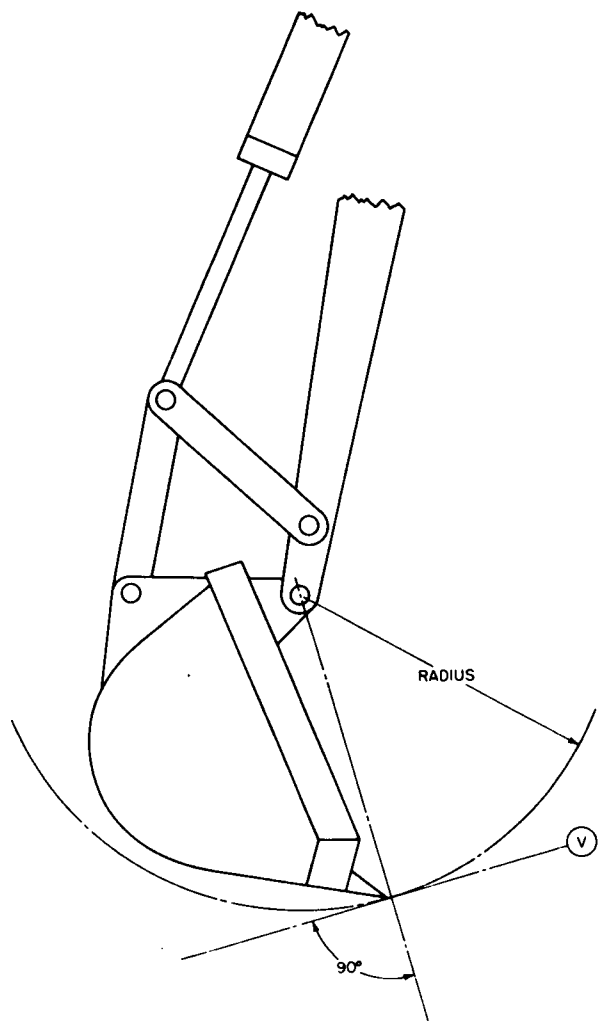


FIG. 7—DIGGING FORCE OF BUCKET CYLINDER

4.2.9 *Vehicle Clearance Circle*—As specified in SAE J695.

4.3 *Operational*—These dimensions to be obtained with main bearing surfaces of the stabilizers on the ground. On rubber-tired units, all the tires are to be tangent to the ground; and on track units, the track is to be on the ground and all rollers to contact the track.

4.3.1 *Digging Depth, Maximum (F)*—The vertical distance in millimetres (inches) from the ground line to the tip of the bucket teeth.

4.3.2 *Digging Depth, 610 mm (2 ft) Flat Bottom (G)*—The vertical distance in millimetres (inches) from the ground line to a flat bottom trench 610 mm (24 in) in length generated by the bucket teeth.

4.3.3 *Digging Depth, 2440 mm (8 ft) Flat Bottom (H)*—The vertical distance in millimetres (inches) from the groundline to a flat bottom trench 2440 mm (96 in) in length generated by the bucket teeth.

4.3.4 *Overall Operating Height, Fully Raised (J)*—The vertical distance in millimetres (inches) from the ground line to the highest point attainable.

4.3.5 *Loading Height (K)*—The maximum vertical distance in millimetres (inches) from the ground to the lowest point of the bucket. Bucket is to be positioned so that a line passing through the hinge pin center and passing through the farthest forward point of the bucket cutting edge shall be 60 deg maximum with respect to the horizontal.

4.3.6 *Loading Reach (L)*—The horizontal distance in millimetres (inches) from the intersection of swing pivot centerline and supporting surface to the bucket teeth with bucket positioned and located as in paragraph 4.3.5.

4.3.7 *Reach from the Swing Pivot (M)*—The maximum horizontal distance in millimetres (inches) from the intersection of the swing pivot centerline and the supporting surface to the bucket teeth at the ground line.

4.3.8 *Swing Pivot to Rear Wheels (N)*—The perpendicular distance in millimetres (inches) from the centerline of the swing pivot to the centerline of the rear wheels.

4.3.9 *Bucket Rotation (P)*—The degrees of uninterrupted rotation about the bucket hinge pin.

4.3.10 *Swing Arc (Q)*—The degrees of uninterrupted rotation about the swing pivot centerline.

4.3.11 *Stabilizer Spread, Operating Position (R)*—The distance in millimetres (inches) between centers of stabilizer pads when positioned as stated.

4.3.12 *Side Shift (S), (Side Shift Backhoes)*—Specify in millimetres (inches) the maximum operating distance which the swing pivot centerline can be offset from centerline of vehicle.

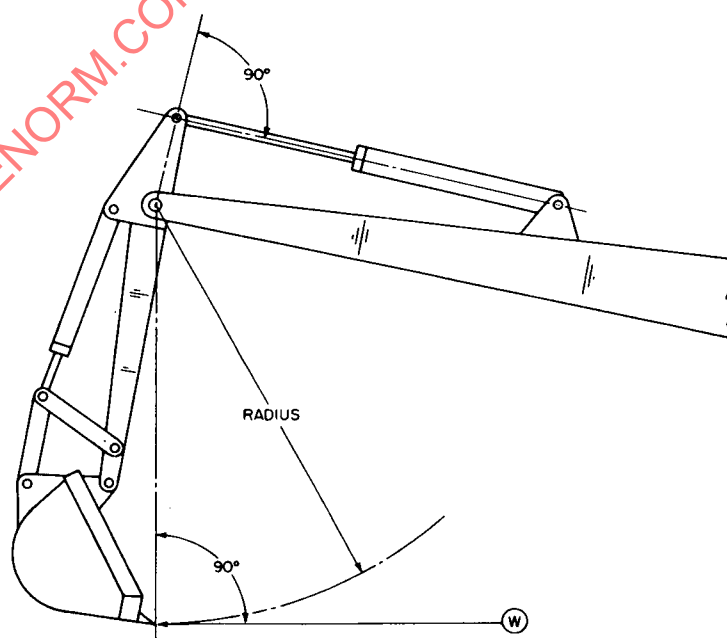


FIG. 8—DIGGING FORCE OF DIPPERSTICK CYLINDER