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Superseding J1234 JAN1985

Specification Definitions—Off-Road Work Machines

Foreword—This cancelled document has been superseded by SAE J/ISO 6746-1.

1. **Scope**—This standard is applicable to off-road work machines, base machine and its equipment, included in categories 1.1, 1.2, 2, 3, and 5 of J1116.

1.1 **Purpose**—This standard defines dimensional, mass, and performance terms.

2. References

2.1 **Applicable Publication**—The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated, the latest revision of SAE publications shall apply.

2.1.1 SAE PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAEJ1116—Categories of Off-Road Self-Propelled Work Machines

2.2 **Related Publications**—The following publications are provided for information purposes only and are not a required part of this document.

2.2.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAEJ1349—Engine Power Test Code—Spark Ignition and Diesel

SAEJ872—Reserve Tractive Ability Test Code

2.2.2 ISO PUBLICATIONS—Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002.

ISO7457—Measurement of Turning Diameter of Wheel Machine

ISO1585—Engine Test Code—Net Power

ISO7464—Method of Test for the Measurement of Drawbar Pull

3. Conditions of Measurement

3.1 **Machine at Rest**—Measurements shall be made with the machine in operating condition, equipped as specified, without payload, resting on the horizontal ground plane (HGP) with zero penetration except for crawler tractors. For crawler tractors, the face of the track shoe will lie on the HGP. The specifications should state the track shoe type and width; or the tire type, size, and ply rating.

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3.2 Machine Operating—Operating performance measurements shall be made with the base machine and its equipment, without payload, with full fuel, lubricating, cooling and hydraulic systems, and with a 75 kg (175 lb) operator.

4. Dimensional Terms

4.1 Heights Without Working Tools—Heights are to be measured from the HGP. Does not include dumper or scraper gooseneck or body, loader bucket, or similar working tools.

4.1.1 HEIGHT WITH CAB OR ROPS (H1)—Distance to the plane passing through the highest point of the machine with cab or ROPS.

4.1.2 HEIGHT WITHOUT CAB OR ROPS (H2)—Distance to the plane passing through the highest point of the machine without cab or ROPS.

4.1.3 HEIGHT WITHOUT CAB OR ROPS AND WITHOUT EXHAUST PIPE, AIR CLEANER, AND OTHER EASILY-REMOVABLE PARTS (H3)—Distance to the plane passing through the highest point of the machine without cab or ROPS and without exhaust pipe, air cleaner, and other easily-removable parts.

4.2 Height, Dumper, or Scraper—Height to be measured from the HGP.

4.2.1 HEIGHT (H4)—Distance to the plane passing through the highest point of the dumper or scraper gooseneck or body with dumper body or scraper in the transport position.

4.3 Ground Clearance—Ground clearance of the base machine without equipment or attachments.

4.3.1 GROUND CLEARANCE, EXCEPT GRADERS (H5)—Distance between the HGP and the lowest point of the central part of the machine. The central part is defined as 25% of the track gauge or tread to either side of longitudinal centerline.

4.3.2 GROUND CLEARANCE, GRADERS (H6)—Distance between the HGP and the lowest point of the front axle at the longitudinal centerline of the machine.

4.4 Widths

4.4.1 WIDTH WITHOUT WORKING TOOL (W1)—Distance between vertical planes parallel to the machine longitudinal axis and passing through the farthest point on the sides of the machine. Does not include working tool, dumper, or scraper draft frame, or body. For graders, circle side shift is in mid-position, front wheel camber is included, wheels not leaned, blade not included.

4.4.2 WIDTH WITH WORKING TOOL (W2)—Distance between vertical planes parallel to the machine longitudinal axis and passing through the farthest point on the sides of the base machine with equipment or attachments. Width W2 includes dumpers or scraper draft frame or body.

4.4.3 TRACK GAUGE, CRAWLER MACHINES (W3)—Distance between parallel vertical planes passing through the mid-width of the sprocket teeth.

4.4.4 TREAD, WHEEL MACHINES (W4)—Distance between vertical planes parallel to the machine longitudinal axis and passing through the centers of the tire contact with the HGP. If front and rear wheel treads are different, both should be specified. For machines with dual wheels, the tread is measured at the mid-point between the centers of the tire contact at each set of dual tires.

4.4.5 TRACK SHOE WIDTH (W5)—Overall width of the shoes in the track chain.

4.5 Length

- 4.5.1 LENGTH WITHOUT WORKING TOOLS (L1)—Distance between vertical planes perpendicular to the machine longitudinal axis and passing through the farthest points on the front and rear of the base machine. Length L1 does not include front- or rear-mounted working tools, dumper, or scraper body, or frame.
- 4.5.2 LENGTH WITH WORKING TOOL (L2)—Distance between vertical planes perpendicular to the machine longitudinal axis and passing through the farthest points on the front and rear of the base machine or equipment or attachments including dumper or scraper body or frame.
- 4.5.3 LENGTH OF TRACK ON GROUND (L3)—Distance between parallel vertical planes passing through the rearmost sprocket or idler axis and the front idler axis.
- 4.5.4 WHEELBASE (L4)—Distance between vertical planes perpendicular to the machine longitudinal axis and passing through the centers of the front and rear wheels. For tandem axles, the distance is measured to a point midway between the tandem axles. For semi-mounted trailer configurations, the wheelbase of the tractor-trailer combination is the distance between vertical planes passing through the rear wheel or tandem center of the tractor and the rear wheel or tandem center of the trailer.
- 4.5.5 TANDEM CENTER DISTANCE (L5)—Distance between the centers of the front and rear wheels of the tandem.

4.6 Angles

- 4.6.1 ARTICULATION ANGLE (A1)—Angle between the straight-ahead position and the maximum-turn position of an articulated frame steer machine. If right and left turn angles are different, both should be specified.
- 4.6.2 ANGLE OF APPROACH (A2)—Angle between the HGP and a plane, tangent to the forward tires or tracks of a machine and passing through the lowest point of any structure or component forward of the tires or tracks, which limits the magnitude of the angle.
- 4.6.3 ANGLE OF DEPARTURE (A3)—Angle between the HGP and a plane, tangent to the rear tires or tracks of a machine and passing through the lowest point of any structure or component behind the tires or tracks, which limits the magnitude of the angle.

- 4.7 **Ground Contact Area**—Area of the tires or tracks in contact with the ground. Effective area depends on load, penetration, ground material, and tire pressure or track adjustment; hence, all pertinent conditions should be specified or carefully described.

The gross contact area of tires on a hard flat surface is the total area within the periphery of the contact pattern of the treads.

The net contact area of the tires on a hard flat surface is the sum of individual actual contacts between the treads and the surface.

For comparative purposes for crawler machines, the ground contact area is customarily calculated using the length of tracks on ground, L3, and the track shoe width, W5.

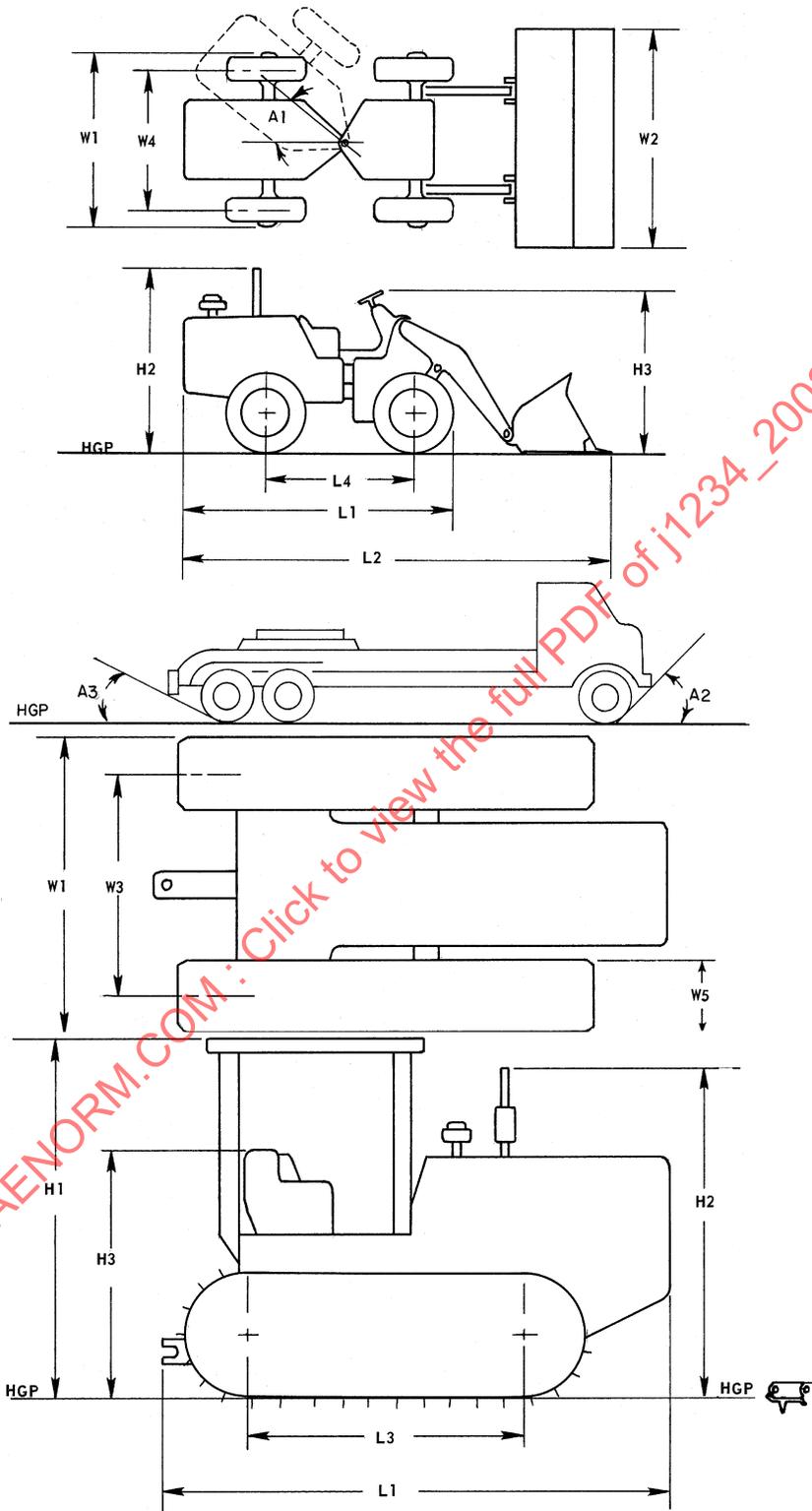
5. *Masses of Machines Equipped as Specified*

- 5.1 **Operating Mass**—Mass of base machine and equipment without payload as described in 3.2.
- 5.2 **Loaded Mass**—Sum of the operating mass and the manufacturer's rated payload.
- 5.3 **Axle Distribution**—Percent of operating mass at each axle; loaded mass at each axle.

6. **Performance Terms**

- 6.1 **Engine Net Power**—Net flywheel power of fully equipped engine.
- 6.2 **Engine Maximum Torque**—Maximum torque developed by fully equipped engine.
- 6.3 **Travel Speeds**—Speeds that can be obtained on a hard horizontal surface in each forward and reverse gear ratio with the engine at rated speed, machine empty of payload.
- 6.4 **Drawbar Pull**—The measured horizontal towing force exerted at the drawbar/hitch point at a stated ground speed and tire/track slip percentage.
- 6.5 **Drawbar Power**—The towing power transmitted through the drawbar/hitch point. It is calculated using travel speed and drawbar pull and stated at a specific ground speed and tire/track slip percentage.
- 6.6 **Turning Radius**—The distance from the turning center to the center of tire contact with the road of the wheel describing the largest circle while the machine is executing the sharpest practicable turn.
- 6.7 **Machine Clearance Circle**—The diameter of the smallest circle which will enclose the outermost point of the vertical projection of the base machine and its equipment while executing its sharpest practicable turn.

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