

**STANDARD**

**SAE J1234**

APPROVED AS ANSI/SAE J1234-1979  
BY AMERICAN NATIONAL  
STANDARDS INSTITUTE

**SPECIFICATION DEFINITIONS—  
OFF-ROAD WORK MACHINES—  
SAE J1234**

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1. **Purpose**—This SAE Standard defines specification terms.

2. **Scope**—This standard defines the more commonly used terms applicable to the majority of the machines defined in SAE J1057a and/or referenced by category in SAE J1116. Other SAE Standards will be used, when necessary, to define terms peculiar to a certain class or type of machine. Such other standards will be in accord with SAE J1234.

### 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.

3.2 **Machine Operating**—Operating performance measurements shall be made with the machine equipped as specified, without payload, with full fuel, lubricating and cooling systems, and with operator 75 kg (175 lb).

### 4. Dimensional Terms

4.1 **Heights Without Working Tools**—Heights are to be measured from the horizontal ground plane. 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 is to be measured from the horizontal ground plane.

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 is of the machine without the working tool or optional attachment.

4.3.1 **Ground Clearance, Except Graders (H5)**—Distance between the horizontal ground plane 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 the longitudinal centerline.

4.3.2 **Ground Clearance, Graders (H6)**—Distance between the horizontal ground plane 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. Width W1 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 points on the sides of the machine or standard or optional working tool. Width W2 includes dumper 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 horizontal ground plane. 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 Lengths

4.5.1 **Length Without Working Tool (L1)**—Distance between vertical planes perpendicular to the machine longitudinal axis and passing through the farthest points on the front and rear of the 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 standard or optional working tool, 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 trailer portion 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 horizontal ground plane 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 horizontal ground plane 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 tires on a hard flat surface is the sum of individual actual contacts between the treads and the surface.

For comparative purpose 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. Weights (Masses) of Machine Equipped as Specified<sup>1</sup>

5.1 **Operating Weight**—Weight of machine without payload as described in paragraph 3.2.

5.2 **Loaded Weight**—Sum of the operating weight and the manufacturer's rated payload.

5.3 **Axle Distribution**—Percent of machine weight or actual weight at each axle, machine empty and loaded.

### 6. Performance Terms

6.1 **Engine Net Power**—Net flywheel power of fully equipped engine operating and corrected per SAE J816.

The  $\phi$  symbol is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.

<sup>1</sup> Use of term weight in this standard means mass. See paragraph 6.1 in SAE J916b.

6.2 Maximum Travel Speeds—Maximum speeds that can be obtained on a hard horizontal surface in each forward and reverse gear ratio, machine empty of payload.

6.3 Rimpull—Horizontal driving force available between the tire and the ground.

Rimpull is given by calculated or measured pull versus machine speed and is usually shown by curves. It is normally specified for dumpers, tractor-scrapers, skidders, and wheel tractors, but not loaders.

6.4 Drawbar Pull—The horizontal force, calculated or measured, available at the drawbar, machine moving forward.

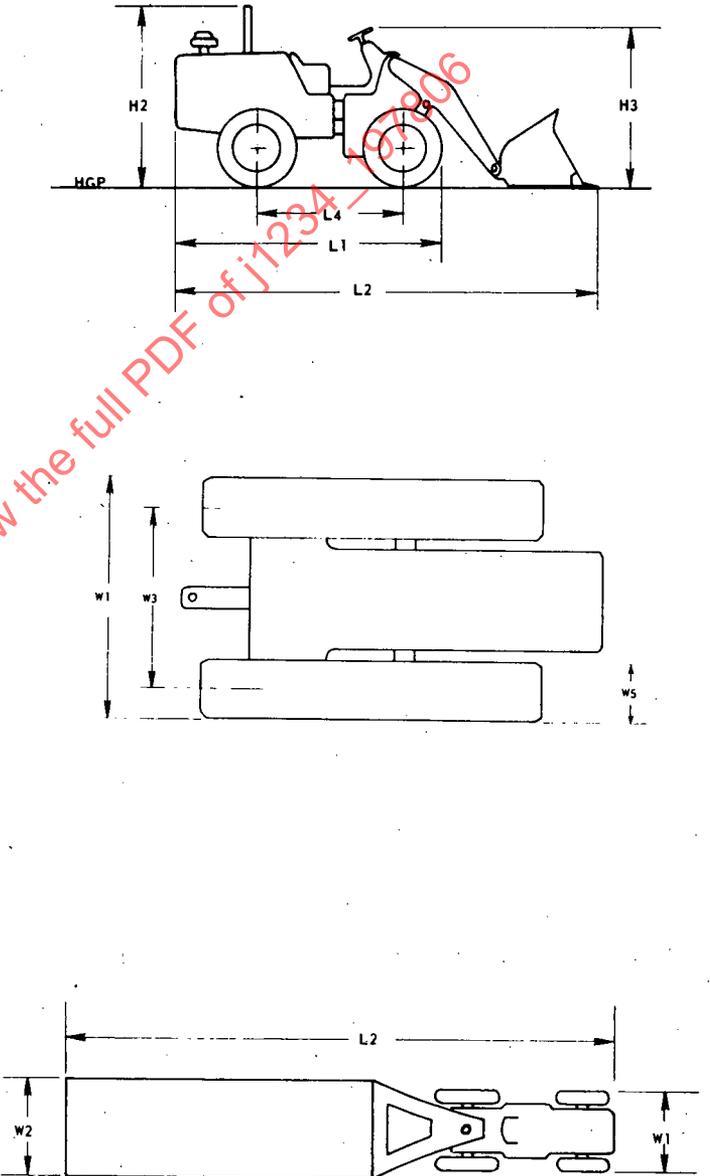
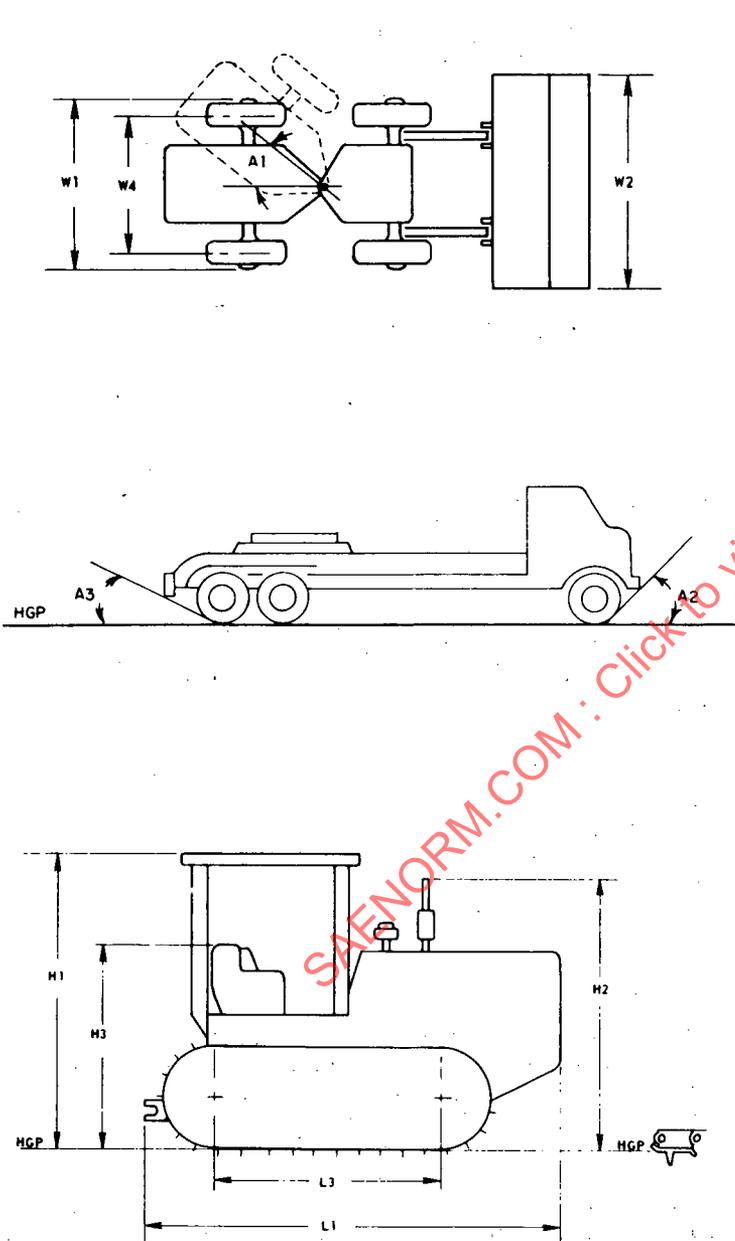
For torque converter, hydrostatic or electric drive machines, the drawbar pull is specified by means of pull versus ground speed curves. For machines without torque converter or other variable torque drive mechanisms, the drawbar pull is reported for each gear ratio at rated governed engine rpm. It may also be reported at maximum engine torque.

Drawbar pull is specified for crawler tractors.

6.5 Turning Radius—Refer to SAE J695.

6.6 Machine Clearance Circle—Refer to SAE J695.

6.7 Braking Performance—Refer to other SAE documents for the types of machines being specified.



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