



SURFACE VEHICLE STANDARD

J2518™

APR2025

Issued 2003-05
Revised 2012-07
Reaffirmed 2025-04

Superseding J2518 APR2019

Lift Capacity Calculation Method Scrap and Material Handlers

RATIONALE

Paragraph 4.1.4 incompletely addresses the orientation and position of oscillating axles and did not address steering axles for lift capacity calculations.

SAE J2518 has been reaffirmed to comply with the SAE Five-Year Review policy.

1. SCOPE

This SAE Standard provides a uniform method to calculate the lift capacity of scrap and material handlers, establishes definitions and specifies machine conditions for the calculations. This document applies to scrap and material handlers as defined in SAE J2506 that have a 360 degrees continuous rotating upper structure. It does not apply to equipment that is incapable of lifting a load completely off the ground. This document applies to those machines that are crawler, wheel, rail and pedestal or stationary mounted.

1.1 Purpose

The purpose of this SAE document is to establish a consistent, repeatable means of determining the lift capacity for the types of equipment contained therein.

1.2 Applicability

Lift capacity calculations and the resulting rated lift capacity chart are developed by the equipment manufacturer or the entity that assembles and or modifies basic components to produce the complete machine for each machine model that is produced.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J2506 Material Handler Nomenclature

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Documents

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2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 SAE Publication

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J2417 Lift Capacity Calculation Method Knuckle - Boom Log Loaders and Certain Forestry Equipment

2.2.2 ASME Publication

Available from American Society of Mechanical Engineers, 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007-2900, Tel: 973-882-1170, www.asme.org.

ASME B30.25, Scrap and Materials Handlers

2.2.3 ISO Publication

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

ISO 10567 Earth-Moving Machinery - Hydraulic Excavators - Lift Capacity

3. DEFINITIONS

3.1 ATTACHMENT

The magnet or grapple that is affixed to the second or third member of a front.

3.2 BALANCE POINT

The theoretical location on the machine at which the forward moment produced by the front, attachment and load is equal to the rearward moment produced by the weight of the machine.

3.3 FRONT

That portion of the machine that is unique and dedicated to the machine's primary purpose, i.e., scrap and material handling. The front, depending upon the type of machine, is also called working equipment, boom set or front linkage. The front consists of two or three structural members actuated by hydraulic cylinders that are affixed to the upper structure.

3.4 GROUND REFERENCE PLANE

For crawler, rail and wheel mounted machines the ground reference plane is that firm level supporting surface that the machine stands on, See Figures 1 through 5. For pedestal or other stationery mounted machines the ground reference plane may be either the firm, level supporting surface the entire machine and structure stands on or an arbitrary but easily distinguished physical feature selected by the manufacturer. See Figure 5. For those machines supplied without a crawler, wheel, rail or pedestal mounting it is the responsibility of the manufacturer to select and define the ground reference plane.

3.5 HOLDING CIRCUIT PRESSURE

The maximum static pressure in a specific circuit, limited by a relief valve at a flow no greater than 10% of rated circuit flow.

3.6 HYDRAULIC LIFT CAPACITY

The load that can be supported from the lift point at a specific lift point position by applying working circuit pressure to any cylinders without exceeding holding circuit pressure in any other circuit.

3.7 LIFT POINT

The location on the front specified by the manufacturer, to which a load may be attached for lifting purposes. Normally the magnet or grapple pivot on the second or third member is the lift point. If more than one lift point is provided, the one having the greatest lift point radius shall be used for determining lift capacities. See Figures 1 through 5. The lift point's location shall be identified on the rated lift capacity chart.

3.8 LIFT POINT HEIGHT

The vertical distance from the ground reference plane to the lift point. See Figures 1 through 5.

3.9 LIFT POINT POSITION

The location of the lift point as defined by the lift point height and radius.

3.10 LIFT POINT RADIUS

The horizontal distance from the axis of rotation to the lift point. See Figures 1 through 5.

3.11 LOAD

The external weight, (kg), that includes the weight of the grapple or magnet and attaching equipment, applied at the lift point.

3.12 MAXIMUM RADIUS (RATED) LIFT CAPACITY

The lift capacity, determined in the same manner as the (rated) lift capacity, except that the lift point position is at the maximum radius for a given lift point height.

3.13 MINIMUM RADIUS (RATED) LIFT CAPACITY

The lift capacity determined in the same manner as the (rated) lift capacity, except that the lift point position is at the minimum radius for a given lift point height.

3.14 RATED HYDRAULIC LIFT CAPACITY

87% of the lesser of the hydraulic lift capacities at a specific lift point position.

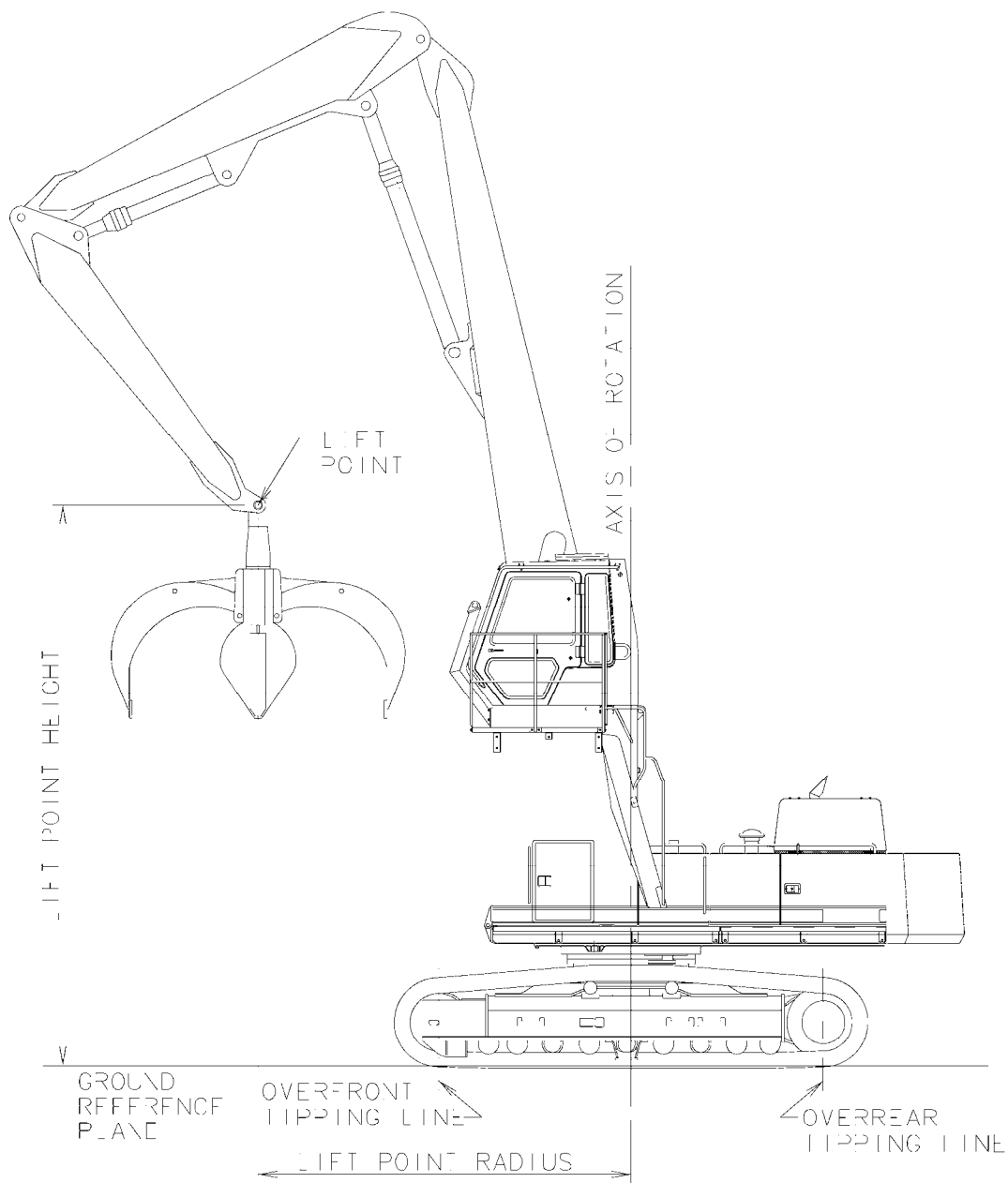


FIGURE 1 - CRAWLER MOUNTED HANDLER

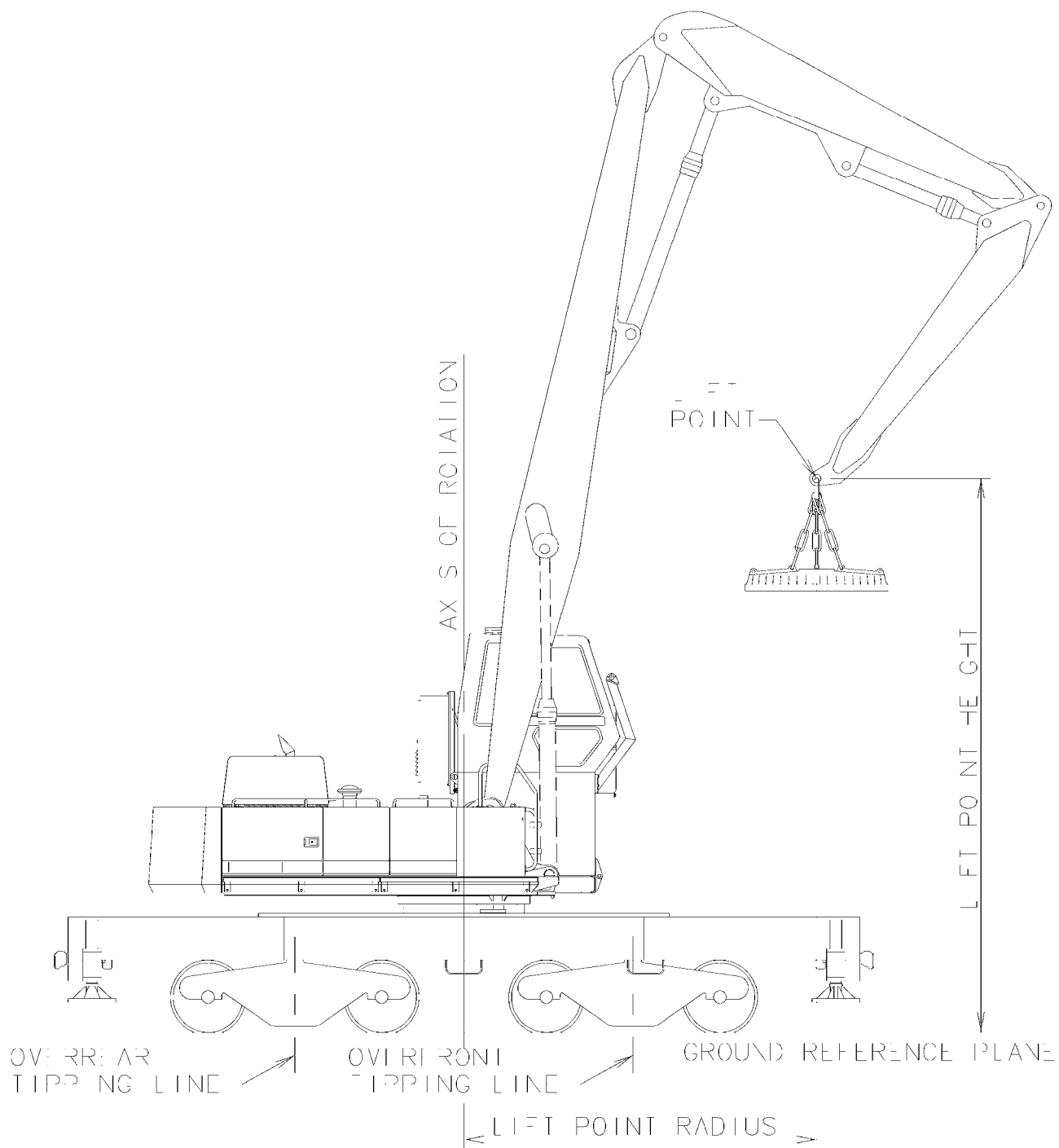


FIGURE 2 - RAIL MOUNTED HANDLER

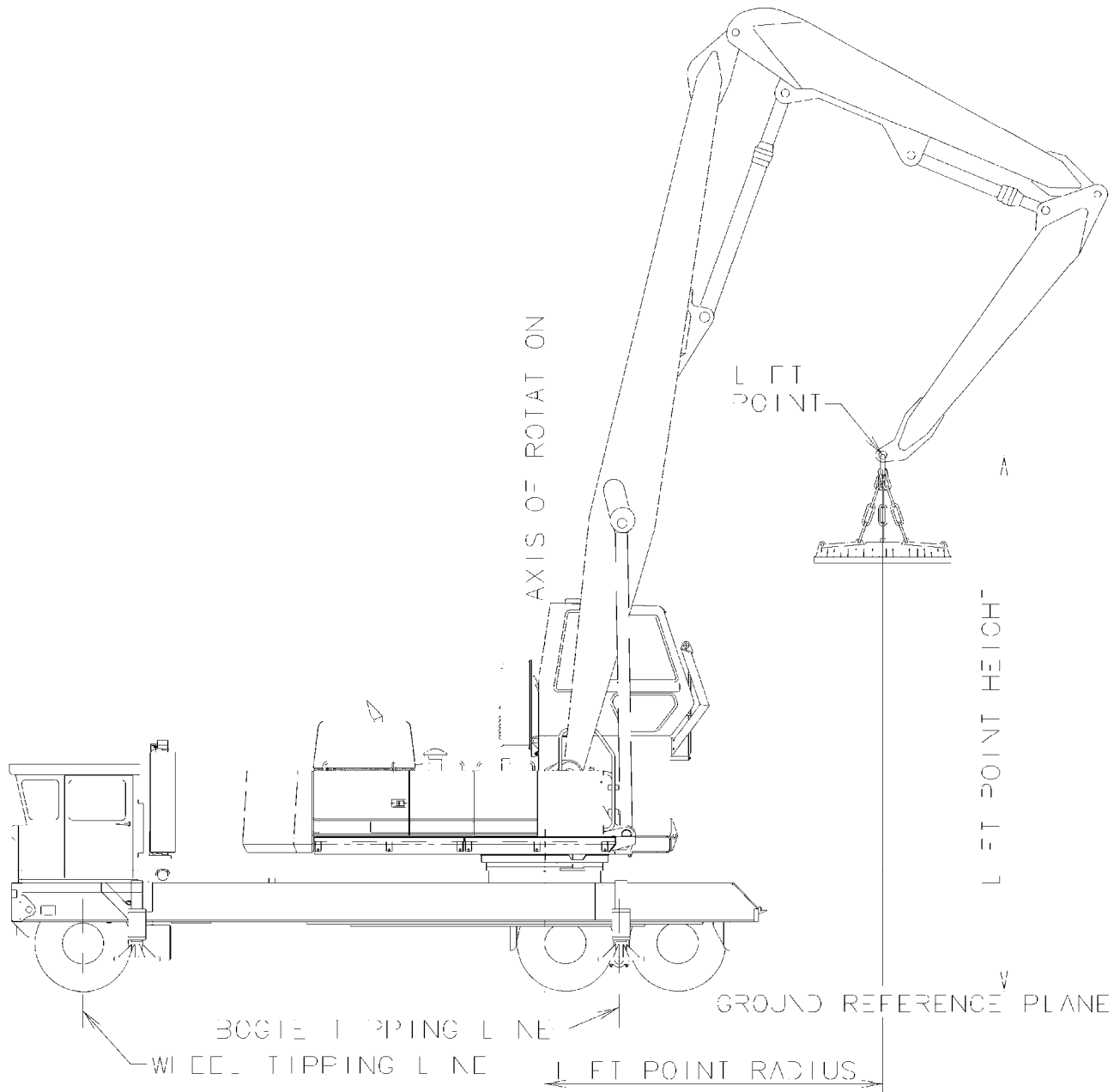


FIGURE 3 - WHEEL-MOUNTED HANDLER