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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 3871.15-2025

Replacing GB/T 3871.15-2006

**Agricultural tractors - Test procedures - Part 15: Centre of
gravity**

农业拖拉机 试验规程 第15部分：质心

(English Translation)

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Table of Contents

Preface
Introduction
1 Scope
2 Normative References
3 Terms and Definitions
4 Test Equipment
5 General Requirements
6 Test Methods
7 Test Report
Appendix A (Informative) Structure Numbering Comparison Table
Appendix B (Normative) Determination of Vertical Coordinate h---Inclination Method (Calculation Method)
Appendix C (Informative) Test Report Format
Appendix D (Informative) Example of determining the vertical coordinate h---tilt method (calculation method)

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 15 of GB/T 3871, "Test Procedures for Agricultural Tractors". GB/T 3871 has already published the following parts.

- Part 1: General Requirements;
- Part 2: Measurement of Overall Machine Parameters;
- Part 3: Power Take-Off Shaft Power Test;
- Part 4: Lifting Capacity of Rear Tri-Point Suspension System;
- Part 5: Turning Circle and Through Circle Diameter;
- Part 6: Determination of Braking Performance of Agricultural and Forestry Vehicles;
- Part 7: Driver's Forward Visibility;
- Part 8: Noise Measurement;

- Part 9: Traction Power Test;
- Part 10: Low Temperature Start-up;
- Part 11: High-Temperature Performance Testing;
- Part 12: Usage Testing;
- Part 13: Exhaust Smoke Measurement;
- Part 14: Non-mechanical power output shaft;
- Part 15: Center of Mass;
- Part 16: Shaft Power Measurement;
- Part 17: Engine Air Filter;
- Part 18: Hydraulic Power at the Tractor-Implement Interface;
- Part 19: Steering Performance of Wheeled Tractors;
- Part 20: Bump Test;
- Part 21: Stability.

This document replaces GB/T 3871.15-2006 "Test Procedures for Agricultural Tractors Part 15: Center of Gravity", and is consistent with GB/T 3871.15-Compared to 2006, aside from structural adjustments and editorial changes, the main technical changes are as follows.

- a) Specialized equipment for the tilting method and the mass cycle method has been added (see 4.2.2 and 4.2.3);
- b) Added requirements for the driver's seat weight and tractor counterweight status (see 5.2);
- c) The requirement for non-linear states of the hinge mechanism has been removed (see 5.4, 2006 edition);
- d) The requirement for suspension locking has been added (see 5.5);
- e) Requirements for outdoor test wind speed, wheels, transmission, and parking brake have been added, and measures to prevent abnormal rolling have been added (see 5.7 and...).
- f) Added requirements for the unit of angle measurement and permissible error (see 5.9);
- g) A method for calculating the lateral coordinate of the center of gravity when there are differences in the wheel track between each axle of a wheeled tractor has been added (see 6.2);
- h) When determining the vertical coordinate using the tilt method, an elevation method can be used (see 6.3.1.1);

i) The determination of vertical coordinates has been added-the tilt method (calculation method) (see 6.3.1.3, Appendix B);

j) The determination of vertical coordinates has been added-the tilt method (see 6.3.2);

k) Added the determination of vertical coordinates---mass cycle method (see 6.3.3);

This document is modified to adopt ISO 789-6:2019 "Test procedures for agricultural tractors - Part 6: Center of mass".

Compared with ISO 789-6:2019, this document has undergone many structural adjustments. A comparison table of the structural numbering changes between the two documents is provided.

See Appendix A.

The technical differences between this document and ISO 789-6:2019, and the reasons therefor, are as follows.

a) Descriptions of the test methods in the standard have been added (see Chapter 1), corresponding to the test methods added in this document;

b) The terms and definitions of "agricultural tractor" and "wheelbase" have been deleted, and the normative reference GB/T 6960.1 (see page 3) has been added.

(Chapter), to enhance the usability of this document;

c) Additional testing equipment for the tilt method and the mass cycle method (see 4.1 and 4.2) has been added to meet the needs of the new testing methods;

d) Increased requirements for fixing the weights and counterweights (see 5.2) to improve measurement accuracy;

e) Requirements for fluid-filled tires have been added (see 5.4), expanding the scope of this document;

f) Increased wind speed requirements for outdoor testing (see 5.7) to improve measurement accuracy and test safety;

g) Increased requirements for the condition of wheels, transmission, and parking brake; added measures to prevent abnormal rolling (see 5.8); and improved measurement accuracy.

Accuracy and safety of the experiment;

h) An angle measurement unit and permissible error have been added (see 5.9) to meet the angle measurement needs in the pitch and roll methods;

i) An improved method for calculating the lateral coordinate of the center of gravity when there are differences in the wheel track width per axle of a wheeled tractor (see 6.2) was

added to improve the accuracy of the measurement;

j) A method for lifting the tractor has been added (see 6.3.1.1), improving the operability of the experiment;

k) A simplified calculation method for wheeled tractors has been added (see 6.3.1.3) to improve testing efficiency;

l) The determination of vertical coordinates-the tilt method (see 6.3.2)-has been added, improving experimental efficiency;

m) The determination of vertical coordinates-the mass cycle method (see 6.3.3)-has been added, improving the applicability of this document;

n) Unify the angle unit to degrees ($^{\circ}$) (see Appendix B) to improve the practicality of this document.

The following editorial changes have been made to this document.

---The standard title "Agricultural Tractor Test Procedures Part 6: Center of Gravity" will be changed to "Agricultural Tractor Test Procedures".

Part 15: Center of Mass;

---Content related to the ISO and IEC databases for maintaining standardized terminology has been removed;

---The rectangular coordinates of the rotating perpendicular line have been changed [see Figure B.9b];

---The data description and calculation formula for "the rectangular coordinates of two points on line A when the front axle is lifted (see Figure B.9)" have been changed, as well as the data description and calculation formula for "the front axle is lifted (see Figure B.9)".

The data description of "coordinates of two points on line A when the shaft is lifted (polar coordinate transformation)" is shown in Table B.2.

---The calculation formulas for "coordinates (rectangular coordinates, see Figure B.9) of two selected points on line B when the rear axle is lifted" and "rotation angle θ_{2} " have been modified.

The symbols and calculation formulas for "coordinates of two points on line B after rotation by θ_{2} ", and the calculation formula for "coordinates of two points on line A after rotation by θ_{2} ".

The calculation formulas for "rearrangement to rectangular coordinates" are shown in Table B.4.

---The code name for tr_2 has been changed (see Table D.1).