



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

GB/T 3871.9-2006

**Agricultural tractors -- Test procedures -- Part 9: Power tests for
drawbar**

(English Translation)

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Foreword

GB/T 3871 "Agricultural tractors - Test procedures" is divided into 19 parts.

Part 1. General requirements;

Part 2. Measurements of tractor parameters;

Part 3. Power tests for power take-off;

Part 4. Rear three-point linkage lifting capacity;

Part 5. Turning and clearance diameters;

Part 6. Determination of braking performance;

Part 7. Operators field of vision;

Part 8. Noise measurement;

Part 9. Power tests for drawbar;

Part 10. Low temperature starting;

Part 11. Suitability tests for hot atmosphere;

Part 12. Working tests;

-Part 13. Measurement of exhaust smoke;

Part 14. Partial power PTO - Non-mechanically transmitted power;

Part 15. Centre of gravity;

Part 16. Axle power determination;

Part 17. Engine air cleaner;

Part 18. Hydraulic power at tractor/implement interface;

- Part 19. Steering capability of wheeled tractors; This part is part 9 of GB/T 3871. This part modifies and adopts ISO 789-9.1990 Agricultural tractors -Test

procedures - Part 1. Power tests for drawbar (English version). This part was redrafted in accordance with ISO 789-9.1990.

Agricultural tractors - Test procedures -

Part 9. Power tests for drawbar

1 Scope

This part specifies the test procedures for determining the power available at the drawbar on agricultural tractors of the wheeled, track-laying or semi-tracklaying type.

The statement of the power rating of the drawbar is specified clause 6.4.

2 Normative references

The following part contains provisions which, through reference in this text, constitute provisions of this part. At the time of publication, the edition indicated was valid. All standards are subject to revision, parties who reach an agreement based on this part are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 3871.3-2006 Agricultural tractors -Test procedures -Part 3. Power tests for power take-off (ISO 789-1.1990, MOD)

JB/T 7282 Type and specifications of oil for tractors

3 Definitions

For the purposes of this part of GB/T 3871, the following terms and definitions apply.

3.1

Wheelbase

The distance between two planes which respectively pass the ground-contact center points of the front and rear wheels at the same side of the tractor and be respectively perpendicular to the longitudinal central plane and supporting plane.

3.2

5.4 Auxiliary equipment

For all tests, accessories such as the hydraulic lift pump or air compressor that can be disconnected without using tools (unless otherwise specified for special test) by the driver during normal operation shall be disconnected. Otherwise, they shall remain operated at minimum load.

If the tractor is equipped with devices that create variable parasitic power losses, such as a variable speed cooling fan, intermittent hydraulic or electrical demands, etc., the device shall not be disconnected or status altered for test purposes. If it is practical for the operator to disconnect the device as outlined by the operator's manual, it may be disconnected for test purposes, in which case this shall be recorded in the test report.

During the test, if the power variations caused by these devices exceed $\pm 5\%$, it shall be recorded in the test report in terms of percent variation from the mean.

5.5 Test conditions

Such measurement values as torque or power do not need corrections for atmospheric conditions or other factors. Atmospheric pressure shall not be less than 96.6 kPa. If this is not possible because of altitude, it is allowed to adjust the carburettor or fuel pump, details of which shall be included in the report.

Before beginning measurement at each test condition, the tractor shall reach stable operating conditions.

5.6 Fuel consumption

Arrange the fuel measurement apparatus so that the fuel pressure at the carburettor or the fuel injection pump is equivalent to that which exists when the tractor fuel tank is half full. The fuel temperature shall be comparable to that which occurs during full load operation for 2 h of the tractor when fuel is taken from the tractor fuel tank. Efforts shall be made to limit the temperature variations throughout the tests. The fuel consumption shall be measured when the tractor traverses a straight track for at least 20 m or for 20 s (whichever is longer).

When using the volumetric method to measure the fuel consumption, it shall be based on the specific gravity of fuel at a certain temperature to calculate the fuel consumption mass per unit of work. Generally, the specific gravity of fuel at 15 °C is used to calculate the volumetric data.

When using the mass method to measure the fuel consumption, the fuel density (specific gravity) value at 15 °C is used to calculate the volumetric data.

5.7 Ballasting and tire pressure

track-laying tractors, if the maximum pull occurs above 7% slip, it shall record the maximum drawbar pull as a footnote beneath the table giving drawbar performance figures.

If the tractor has a hydrokinetic torque converter which can be locked out by the driver, carry out the test both with the torque converter in operation and with it locked out.

If the tractor has a stepless variable transmission, carry out the test at six transmission ratios approximately equally spaced, including that at which maximum power is obtained. Record in the table the drawbar power, speed, wheel or track slip and fuel consumption as a function of drawbar pull.

6.2.2 Unladen tractor

This test determines the effective power provided by each gear to the drawbar when the unladen tractor is in a certain gear range. The test shall be carried out at least on each gear between the position one gear higher above the gear where the tractor can produce the maximum drawbar power and the position one gear lower than the gear where the tractor can produce the maximum drawbar power.

6.2.3 Ballasted tractor

This test determines the drawbar power of the ballasted tractor, the ballast shall be consistent with that provided in the technical parameters of the manufacturer, the test gear shall cover all forwarding gears from the minimum gear to the position one gear higher above that producing the maximum power.

6.3 10 h test

6.3.1 For the ballasted tractor as specified in clause 6.3, it shall be tested for 5 h as specified by the manufacturer at the gear as agreed by the testing party. This gear shall be the common gear for agricultural operation (such as ploughing) and the gear as far from the gear for the test of 6.3.2 as possible, the pull load applied shall be 75% of the drawbar force corresponding to the maximum drawbar power at the engine rated speed. It shall state the drawbar power, drawbar force, driving speed, slip ratio, and fuel consumption, etc., in the report.

For the tractor equipped with the operator-controllable hydraulic torque converter, the 5 h test shall be carried out under the status where the hydraulic torque converter works, but it shall be within the limitations as specified in the instruction manual which is formally published by the manufacturer. If reaching the limit conditions, the test shall be carried out under the status where the hydraulic torque converter does not work. The test report shall respectively state the time and fuel consumption for the two parts of tests.

be maintained stable during the test, the maximum drawbar power is the average value as