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

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**Agricultural tractors -- Test procedures -- Part 3: Power tests for
power take-off**

(English Translation)

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1 Scope

This part specifies the test procedures for determining the power available at the power take-off (PTO), and at the belt or pulley shaft, on agricultural tractors of the wheeled and track-laying type.

The statement of the power rating of the PTO is specified clause 6.3.

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 1592 Agricultural tractors - Rear-mounted power take-off - Types 1, 2 and 3 (GB/T 1592-2003, ISO 500:1991, IDT)

JB/T 7282 Type and specifications of oil for tractors

3 Definitions

For the purposes of this part, the following terms and definitions apply.

3.1

Rated engine speed

Engine speed specified by the tractor manufacturer for continuous operation at full load.

3.2

Power take-off power:

Power measured at the dynamometer coupled to any shaft (with the tractor from the tractor fuel tank).

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.

6.1 Power take-off test

For the tractors equipped with the power take-off as specified in GB/T 1592, it shall test one or more power take-off as given by the tractor manufacturer.

When one of the power take-off is capable of transmitting the full power of the engine, it shall also include the test for this power take-off.

6.1.1 General

All tests shall generally be able to be carried out continuously.

The angle of the connection of the shaft connecting the tractor PTO to the dynamometer shall not exceed 2°.

If an exhaust gas discharge device for the test area is used, it shall not impact the engine performance.

6.1.2.1 Maximum power

After the engine is warmed up to reach the stable running conditions, under the maximum power of the power take-off, the tractor is subject to 2 h test; Measure the speed, torque and fuel consumption, etc.

The maximum power quoted in the test report shall be the average of at least six readings made at regular intervals during the 2 h period. If the measured power varies by more than 2 % from the average, repeat the test. If the variation continues, it shall report this deviation.

For a tractor not fitted with a PTO capable of transmitting the full power of the engine, operate it for 2 h at a power specified by the manufacturer for the test.

If possible, a 20 % increase in power shall be applied every 5 min for a period of 1 min. If the engine cannot develop the 20 % increase in power, carry out the intermittent test at full

engine power. Omit the tests described in 6.1.3 and 6.1.4.

6.1.6 Presentation of results

The data in 6.1.1 to 6.1.4 shall be recorded in tabular form. If also presented in graphical form (which is optional), the following curve relations, covering the full range of engine speeds tested, shall be included:

- Power as a function of speed;
- Torque as a function of speed;
- Fuel consumption (mass) and specific fuel consumption (mass) as a function of speed;
- Specific fuel consumption (mass) as a function of power.

Record the no-load maximum engine speed.

6.1.7 Additional measurements

In addition to the performance measurements, it shall also record the following data:

- At about 2 m in front or side of the tractor, in front of the air inlet of the tractor fan, measure the atmospheric temperature at a representative point about 1.5 m above ground. When the tractor is equipped with forward-blowing fan, this point shall be about 2 m behind of the tractor, at a height 1.5 m above ground;
- Measure the air inlet temperature of the engine in the upwind air flow at a point 5 cm away from the inlet of the air cleaner, the temperature probe shall be equipped with the device to prevent radiated heat;
- Atmospheric pressure;
- Relative air humidity;
- Measure the coolant temperature at the water outlet of the engine (in the case of an air-cooled engine, measure the temperature of the cylinder block at representative points);
- The fuel temperature at the inlet to the carburettor or injection pump;
- Measure the engine oil temperature at the half point of oil level depth in the engine bottom shell.

6.2 Belt or pulley shaft tests (optional)

At the manufacturer's request, the power available at the belt or pulley shaft of tractors, if fitted, may be measured.

Appendix A (Normative)

Power take-off test report

A.1 Location

Tractor manufacturer's name and address: _____

Place of running in: _____

Duration of running in: _____

A.2 Specification of tractor

Tractor

Model: _____ Serial No.: _____

Engine

Make: _____ Model: _____

Type: _____ Serial No.: _____

Rated speed: _____ r/min

Cylinders

Number: _____ Bore: _____ mm

Stroke: _____ mm Capacity: _____

Fuel and injection system

Capacity of fuel tank: _____ L

Make, type and model of injection pump: _____

Manufacturer's production setting: _____

Make, type and model of injectors: _____

Make, type and model of magneto, coil and distributor: _____

Make, type and model of carburettor: _____

Ignition or injection timing (manual or automatic): _____

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