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Tractors and machinery for agriculture and forestry — Guards for power take-off (PTO) drive-shafts —

Part 1: Strength test

*Tracteurs et matériels agricoles et forestiers — Protecteurs d'arbres de
transmission à cardans de prise de force —*

Partie 1: Essai de résistance



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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 5674-1 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 2, *Common tests*.

This first edition of ISO 5674-1 cancels and replaces the first edition of ISO 5674:1982, of which it constitutes a technical revision.

ISO 5674 consists of the following parts, under the general title *Tractors and machinery for agriculture and forestry — Guards for power take-off (PTO) drive-shafts*:

- Part 1: *Strength test*
- Part 2: *Wear test*

Annex A of this part of ISO 5674 is for information only.

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Tractors and machinery for agriculture and forestry — Guards for power take-off (PTO) drive-shafts —

Part 1: Strength test

1 Scope

This part of ISO 5674 specifies the test methods and requirements for determining the robustness and durability of guards for power take-off (PTO) drive-shafts as specified in ISO 5673.

Because such equipment is part of world-wide trade, which implies re-export of PTO drive-shafts to countries with extreme temperatures, a temperature of $-35\text{ }^{\circ}\text{C}$ has been specified for some tests.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 5674. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 5674 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 4254-1:1989, *Tractors and machinery for agriculture and forestry — Technical means for ensuring safety — Part 1: General*.

ISO 5673:1980, *Agricultural tractors — Power take-off drive shafts for machines and implements*.

3 Definitions

For the purposes of this part of ISO 5674, the following definitions apply.

3.1 PTO drive-shaft: Drive-shaft which meets the requirements of ISO 5673.

3.2 (shaft) closed length: (See ISO 5673:1980, subclause 4.1.)

3.3 (shaft) extended length: (See ISO 5673:1980, subclause 4.2.)

3.4 non-rotating PTO drive-shaft guard: PTO drive-shaft guard held stationary while the shaft is rotating.

3.5 rotating PTO drive-shaft guard: PTO drive-shaft guard which can rotate with the shaft except when it comes into contact with some other object.

4 Test conditions

4.1 The guard, which shall be taken from production and be within the tolerance shown on production drawings, shall be subjected to the appropriate tests given in 5.2 to 5.6 following the test sequence given.

The operating and maintenance instructions shall be complied with as described by the manufacturer. The guard shall be tested in conjunction with a PTO drive-shaft of 1 m closed length (3.2) for which it is intended. The same guard shall be used throughout the test. The results obtained from a sample shall be presumed to be valid for guards of shorter and longer length.

4.2 When the guard is made of plastics material, it is assumed to have been certified by the manufacturer to be resistant to UV-radiation.

4.3 Tests shall be carried out at an ambient temperature between $5\text{ }^{\circ}\text{C}$ and $35\text{ }^{\circ}\text{C}$, except as specified in 5.4 and 5.5.

4.4 Where a test procedure requires the shaft to be rotated, the rotational frequency shall be $1\,000\text{ min}^{-1}$.

5 Tests

5.1 General

After each test, note and record the condition of the guard with particular reference to any fractures, permanent deformation or detachments of components.

5.2 Axial loading test at ambient temperature

With the PTO drive-shaft and guard stationary, apply an axial force of 250 N between the cone and the tube in both directions. The force shall be gradually applied and then held for a minimum of 60 s. If the cones, or method of attaching them to the tubes, are not the same, each cone end shall be tested.

5.3 Radial loading test at ambient temperature

5.3.1 Support the guarded PTO drive-shaft in a horizontal, straight line by its usual end connections, extended to the maximum length recommended by the manufacturer.

5.3.2 Rotate the PTO drive-shaft and, using a smooth flat 100 mm wide wooden beam, apply a direct load of 500 N for 60 s at right-angles to the shaft guard at its mid-point.

To avoid excessive vibration, the wooden beam shall be supported by a 20 mm thick rubber backing of approximately A/20 Shore hardness (see figure 1).

When applying the load, care shall be taken to ensure that no impact load is applied.

5.3.3 Rotate the PTO drive-shaft and, using the wooden beam described in 5.3.2, apply a direct force of 500 N to the cone over the centre of the articulation of the universal joint, when in line with the PTO drive-shaft, for 60 s as shown in figure 1. The force shall be applied perpendicular to the PTO drive-shaft.

If the method of attachment of the guard to the shaft is not identical at each end, then test both ends.

5.3.4 Record whether any additional part of the shaft was exposed during or after the test.

5.4 Axial loading test at freezing temperature

5.4.1 Lower the temperature to $-35\text{ }^{\circ}\text{C}$ and maintain the PTO drive-shaft and guard at that temperature for 1 h.

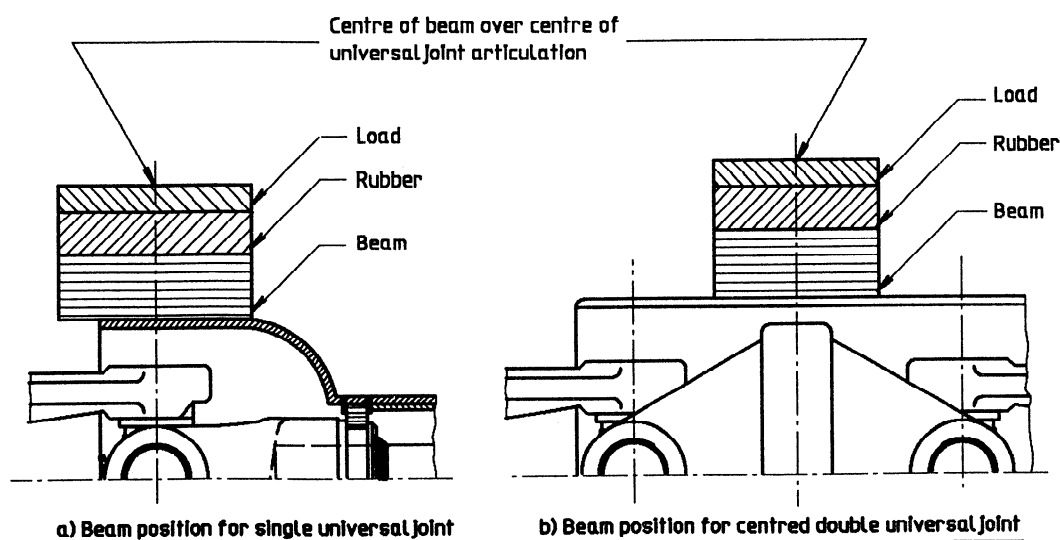


Figure 1 — Radial load test of cone