
Methods of test for
Seats on agricultural wheeled tractors

Part 1 . Tests on artificial track

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The Agricultural Machinery and Implements Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

- | | |
|--|---|
| *Agricultural Engineers' Association | Institution of Agricultural Engineers, Incorporated |
| Agricultural Machine Parts Export Association | *Ministry of Agriculture, Fisheries and Food |
| *British Agricultural and Garden Machinery Association Limited | *National Farmers' Union |
| British Lawn Mower Manufacturers' Federation | *National Institute of Agricultural Engineering |
| *Department of Trade and Industry (Mechanical Engineering) | Royal Welsh Agricultural Society |

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- | | |
|---|--|
| Association of Hydraulic Equipment Manufacturers | Tyre Manufacturers' Conference Service Committee |
| National Union of Agricultural and Allied Workers | University of Melbourne |
| Society of Motor Manufacturers and Traders | |

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Foreword

This British Standard has been prepared under the authority of the Agricultural Machinery and Implements Industry Standards Committee. It was first published in 1967 at the request of The National Farmers' Union and the National Union of Agricultural and Allied Workers. Further research and developments in the national and international fields have led to a review and up-dating of the standard. The main changes in this revision concern:

- (1) the frequency weighting of transmitted vibration to reflect the frequency sensitivity of the human body, in accordance with International Standard 2631 (in course of preparation);
- (2) the use of a frequency-selective 'ridemeter' to enable vibration transmission to be rapidly recorded as a single figure;
- (3) improved technique specification, as a result of practical experience, to give greater precision.

The standard defines methods of test so that the effectiveness of seats on agricultural wheeled tractors in attenuating ride vibration due to ground irregularities can be measured on a scientific basis. It lays down procedures and the equipment required for testing in order also to:

- (1) establish the seat reference point;
- (2) verify the seat dimensions;
- (3) determine the static deflection characteristics of the seat;
- (4) ascertain the lateral stability of the seat.

British Standard Methods of test for Seats on agricultural wheeled tractors

Part 1. Tests on artificial track

1. Scope

This Part of this British Standard specifies tests for a seat intended to be used with a nominated tractor model. The tests specified provide for the measurement of transmitted vertical vibration on an artificial track, details of which are given in the appendices. The methods of measurement of the important dimensions of the seat and of its static deflection and lateral stability characteristics are also defined. A specimen report is included in Appendix F to show the way in which the results should be reported.

NOTE. The title of the standard referred to in this standard is given on the inside back cover.

2. Definitions

For the purposes of this Part of this British Standard, the following definitions apply:

Vibration. A ride motion, especially of an oscillatory nature.

Vibration acceleration. The second differential with respect to time of the vibratory displacement.

Vibration ratio. The ratio of the weighted value of vibration acceleration on the seat to that on the vehicle, adjacent to the seat mounting position.

3. Pre-test operation

Before carrying out on a seat the tests described in Appendices A to E, the seat shall normally be run in by the manufacturer. The running in shall be carried out in collaboration with the testing station. Details of the place, mode and length of running in shall be given in the test report.

4. The tractor

The test tractor may be supplied with or without a safety frame or cab and the cab if fitted, shall be identified in the report. No additional mounted equipment shall be carried by the tractor, which shall also not be ballasted by wheel or frame weights or by liquid in the tyres. The tyres used shall be a standard size for the tractor, the height of the tread-bars used shall be not less than 65 % of the height of the bars when new and the tyre walls shall not be badly worn. The inflation pressures shall be within the limits specified by the tyre manufacturer for field work. The wheel track setting shall be that most commonly used for the type of tractor on which the seat is mounted, in normal field operations.

5. Repairs during tests

Any failure of components of the seat during the tests, along with incontrovertible signs of wear of bearings or suspension elements, shall be reported.

6. Calibration

All equipment shall be calibrated regularly, where possible in accordance with existing standards or recommendations.

7. Testing

Seats shall be verified and, where appropriate, tested in accordance with Appendices A to E.

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Appendix A

Determination of seat reference point

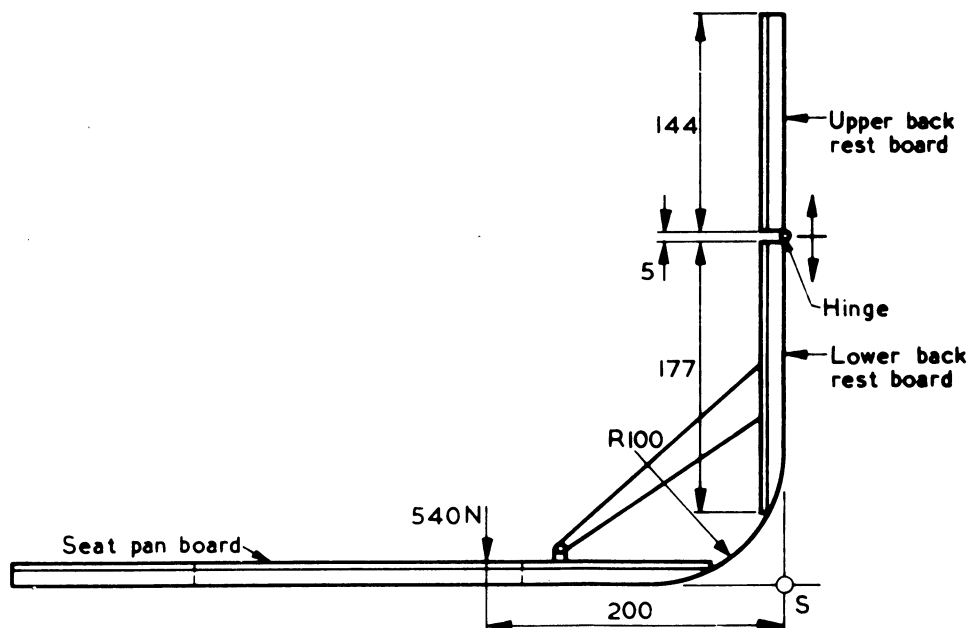
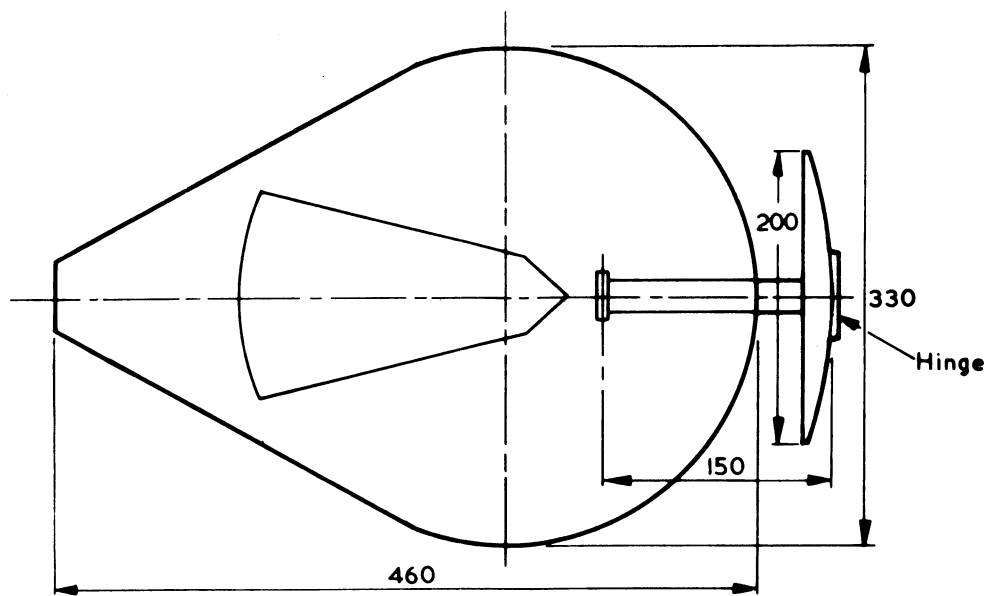
A.1 Definition of seat reference point. The point in the central longitudinal plane of the seat where the tangential plane of the lower backrest and a horizontal plane intersect. This horizontal plane cuts the lower surface of the seat pan board 150 mm in front of the seat reference point.

A.2 Apparatus. The seat reference point and other measurements shall be obtained using the apparatus illustrated in Figs. 1 and 2 to simulate loading by a human occupant. The apparatus shall consist of a seat pan board and backrest boards. The lower backrest board shall be jointed in the region of the ischium humps (A) and loin (B), the joint (B) being adjustable in height.

A.3 Procedure. Position the apparatus on the seat. Apply a force of 540 N at a point 50 mm in front of joint (A) and lightly press the two parts of the backrest board tangentially against the backrest.

NOTE. If it is not possible to determine definite tangents to each area of the backrest (below and above the lumbar region), the following should be done.

- (1) No definite tangent to the lower area possible: lightly press the lower part of backrest board against the backrest vertically.
- (2) No definite tangent to the upper area possible: if the lower part of the backrest board is vertical, fix the joint B at a height 230 mm above the seat reference point. Lightly press the two parts of the backrest board against the backrest tangentially.



Dimensions in millimetres

Fig. 1. Apparatus for determination of seat reference point

Appendix B

Verification of seat dimensions

B.1 Apparatus. The apparatus shall be as shown in Fig. 2.

B.2 Procedure. (See Figs. 2 and 3.)

B.2.1 Determine the dimensions detailed in **B.2.3** with the seat set to be at or as near as possible to the mid point of any horizontal or vertical adjustment range.

B.2.2 Set the seat adjustment for varying operators' weight for the seat to be at the mid point of the suspension travel, unless this is in contradiction of the manufacturer's clearly stated instructions.

NOTE. Where the seat cannot be set at the mid point due, for example, to there being only an even number of fixed alternative positions, correct all relevant dimensional measurements to allow for the difference between the mid point and the measurement point adopted.

B.2.3 Determine the following dimensions:

- (1) horizontal distance parallel to the longitudinal plane of the tractor from the front edge of the seat pan to the transverse plane containing the seat reference point (S) measured at 150 mm to the side of the central longitudinal plane of the seat (d);
- (2) width of the seat pan (W) at a horizontal distance of 150 mm forward of the seat reference point, both at the level of the cushion and at a height of 80 mm above the seat reference point;
- (3) vertical height of the uppermost edge of the backrest above the seat reference point (l), and approximate range of support of backrest (r);
- (4) angle of tilt of seat pan (α). Additionally the angles between the lumbar support and the vertical (β), and between the upper backrest and the vertical (γ) may also be measured where practicable.
- (5) height of seat reference point (S), above the normal resting plane of the feet on the tractor platform, and on other footrests (h_1 and h_2);
- (6) dimensions of armrests (height, distance apart, both at a horizontal distance of 150 mm forward of the seat reference point) and horizontal extension of armrests forward from the seat reference point;
- (7) horizontal adjustment of seat (U);
- (8) vertical adjustment of seat (V). (It shall be stated whether (U) and (V) are linked.)
- (9) horizontal distance between the seat reference point, and the depressed clutch and brake pedals (X);
- (10) vertical distance between seat reference point, and the depressed clutch and brake pedals (Y);
- (11) horizontal distance between the seat reference point, and the rear-most point of the steering wheel (Z);
- (12) vertical distance between lowest part of steering wheel and the front of the seat pan surface (f).