

# COMMISSION OF THE EUROPEAN COMMUNITIES

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PROPOSAL FOR A COUNCIL DIRECTIVE  
ON THE APPROXIMATION OF THE LAWS OF THE MEMBER STATES  
RELATING TO THE DRIVER'S SEAT  
ON WHEELED AGRICULTURAL OR FORESTRY TRACTORS

(submitted to the Council by the Commission)



EXPLANATORY MEMORANDUMI. GENERAL REMARKS

The Community type-approval procedure for wheeled agricultural and forestry tractors, which was the subject of Council Directive 74/150/EEC of 4 March 1974 (1), provides the general frame of reference for the chapter on seats, including the driver's seat.

On 23 July 1968 (2), the Commission forwarded to the Council a proposal for a directive on certain components and characteristics of wheeled agricultural tractors, in which the requirements relating to the driver's seat were laid down in Section XIII of the technical annex.

The Council felt that it would not be expedient to examine these requirements prior to the adoption of the Directive on type-approval, since the latter would introduce the administrative procedure to be followed in the various directives on technical aspects. The Directive on type-approval, which was proposed by the Commission in July 1968, was not adopted by the Council until March 1974. Hence the requirements under Section XIII of the July 1968 proposal for a directive on certain components and characteristics are now completely outdated on account of the importance which has been assumed in the meanwhile by the question of protection for the tractor driver when he is driving on the road or, operating the tractor on the land.

With the aim of following up and, if possible, carrying further the progress that has been made towards protecting the tractor driver, the Commission decided to revise its original proposal. The amendments were so considerable that it was necessary to draw up a new proposal for a directive.

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(1) OJ No L 84 of 28 March 1974

(2) OJ No C 125 of 28 November 1968

In August 1974, the Danish Government notified the Commission, in accordance with the Agreement of the Governments of the Member States meeting in Council of 28 May 1969 (as amended on 5 March 1973) concerning standstill and information for the Commission (1), of its intention to legislate on this matter. The Commission informed that Government of its intention of forwarding to the Council a new proposal for a directive and expedited its work in this field. However, the technical complexity of the new requirements relating to the driver's seat prevented the Commission from completing its work within the time limit laid down in the "Standstill Agreement". The Danish Government, aware of the difficulties encountered by the Commission in drawing up this proposal, has deferred putting into force of the national requirements envisaged, at the same time stressing the urgent necessity for the Community to arrive at a common solution as soon as possible.

## II. TECHNICAL CONSIDERATIONS

This proposal for a directive lays down the construction and testing specifications necessary for EEC type-approval of driver's seats as components of wheeled agricultural or forestry tractors, together with the requirements for fitting a driver's seat to the tractor for EEC type-approval of the latter. The seat construction specifications concern in particular the dimensions of the seat surface, the position and inclination of the backrest, the adjustment of the seat and the vibratory movement of the seat. The specifications in respect of the tests to be carried out concern in particular the important aspect of the vibrations to which the human body as a whole is exposed. Although the data on the endurance of vibrations by the human body and on the body's reactions are not yet quite complete, present scientific knowledge can be considered reliable enough to enable tests to be proposed

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(1) OJ No C 76 of 17 June 1969  
OJ No C 9 of 15 March 1973

to which the driver's seats must be subjected in order that the jolting and the vibrations can be reduced as much as possible. The object of the tests proposed is to determine (a) the characteristics of the suspension system and of the adjustment range as a function of the driver's weight, (b) the lateral stability and (c) the vertical vibratory movement. The vibratory movement of the seat is to be determined, according to the type of tractor for which the seat is intended, by means of tests on a standardized track and/or on a test bench.

EEC type-approval will be granted for any type of driver's seat which, after verification, satisfies the requirements laid down by the directive, and a type-approval number will be assigned to the entire series of this type of seat.

EEC type-approval of a tractor type in respect of the driver's seat will be granted if the seat bears the EEC type-approval mark and if it is fitted to the tractor in accordance with the requirements laid down therefor.

### III. COMMENTS ON THE ARTICLES

Articles 1 to 6 establish the EEC type-approval procedure for driver's seats. The purpose of this procedure is to permit the free movement of these seats within the Community by prohibiting the Member States from preventing their marketing when they comply with the construction and test specifications laid down in the annexes and when they bear the EEC type-approval mark the model of which is shown in Appendix 11 to Annex II. This procedure provides for a reciprocal information system in respect of every case of granting, refusing or withdrawing an EEC type-approval.

Article 7 integrates this Directive into the EEC type-approval procedure.

As certain new Member States have no national type-approval procedure at present, it is necessary to lay down provisions to guarantee the use in these Member States of wheeled agricultural or forestry tractors

conforming to the requirements of the Directive (Article 8) (1).

The scope of this Directive is laid down in Article 9.

Article 10 lays down the procedure for adapting the directive to technical progress. This procedure is set out in Article 13 of the Council Directive of 4 March 1974 on the type-approval of wheeled agricultural or forestry tractors.

Article 11(1) lays down two time limits. Before expiry of the first time limit, the Member States are obliged to adopt and publish the measures necessary for compliance with the Directive. The second time limit determines the date on which all the Member States must simultaneously apply the common rules.

Finally, the Commission must be informed within a reasonable time of any draft provisions drawn up by the Member States in the field covered by the Directive, so that it can formulate any comments it may wish to make on the relevant text or texts (Article 11(2)).

IV. CONSULTATION OF THE EUROPEAN PARLIAMENT AND THE ECONOMIC AND SOCIAL COMMITTEE

The opinions of these two bodies must be obtained in accordance with the provisions of the second paragraph of Article 100.

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(1) OJ No L 73 of 27 March 1972 : "Documents concerning the accession to the European Communities of the Kingdom of Denmark, Ireland, the Kingdom of Norway and the United Kingdom of Great Britain and Northern Ireland". Act concerning the conditions of accession and the adjustments to the treaties - Annex I, Section X.

Draft proposal for a Directive relating to the driver's seat on wheeled agricultural or forestry tractors,

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 100 thereof,

Having regard to the proposal from the Commission,

Having regard to the Opinion of the European Parliament,

Having regard to the Opinion of the Economic and Social Committee,

Whereas the technical requirements which tractors must satisfy pursuant to national laws relate, inter alia, to driver's seats;

Whereas these requirements differ from one Member State to another, whereas it is therefore necessary that all Member States adopt the same requirements either in addition to or in place of their existing regulations, in order to allow the EEC type-approval procedure which was the subject of Council Directive 74/150/EEC of 4 March 1974 on the approximation of the laws of the Member States relating to the type-approval of wheeled agricultural or forestry tractors (1) to be applied in respect of each type of tractor;

Whereas a regulation on driver's seats includes not only the requirements for their installation on the tractors but also for the construction of these seats; whereas a harmonized type-approval procedure would enable for each Member State to check compliance with the common construction and testing requirements and to inform the other Member States of its findings by sending a copy of the type-approval certificate completed for each type of driver's seat; whereas the placing of an EEC type-approval mark on all driver's seats manufactured in conformity with the approved type obviates any need for technical checks on these driver's seats in the other Member States;

Whereas, in order that the reciprocal recognition system by Member States of the tests carried out by them individually on the basis of the common requirements may function properly, these requirements must be applied by all Member States with effect from the same date,

HAS ADOPTED THIS DIRECTIVE :

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(1) OJ No L 84, 28.3.1974, p. 10

Article 1

1. Each Member State shall grant EEC component type-approval in respect of any type of driver's seat which satisfies the construction and testing requirements laid down in Annexes I and II.
2. The Member State which has granted EEC component type-approval shall take the measures required in order to verify that production models conform to the approved type, in so far as is necessary and if need be in cooperation with the competent authorities in the other Member States. Such verification shall be effected by means of spot checks.

Article 2

Member States shall for each type of driver's seat which they approve pursuant to Article 1, issue to the manufacturer, or to his authorized representative, an EEC component type-approval mark conforming to the model shown in item 3.5. of Annex II for each type of driver's seat.

Member States shall take all appropriate measures to prevent the use of marks liable to create confusion between driver's seats which have been type-approved pursuant to Article 1 and other devices.

Article 3

1. No Member State may prohibit the placing on the market of driver's seats on grounds relating to their construction if they bear the EEC component type-approval mark.
2. Nevertheless, a Member State may prohibit the placing on the market of driver's seats bearing the EEC component type-approval mark which consistently fail to conform to the approved prototype.

That State shall forthwith inform the other Member States and the Commission of the measures taken, specifying the reasons for its decision.



#### Article 4

The competent authorities of each Member State shall within one month send to the competent authorities of the other Member States a copy of the component type-approval certificates, an example of which is given in Annex III, completed for each type of driver's seat which they approve or refuse to approve.

#### Article 5

1. If the Member State which has granted EEC component type-approval finds that a number of driver's seats bearing the same EEC component type-approval mark do not conform to the type which it has approved, it shall take the necessary measures to ensure that production models conform to the approved type. The competent authorities of that State shall advise those of the other Member States of the measures taken, which may, where necessary, and in the event of systematic failure to conform, extend to withdrawal of EEC component type-approval. The said authorities shall take the same measures if they are informed by the competent authorities of another Member State of such failure to conform.
2. The competent authorities of the Member States shall inform each other within one month of any withdrawal of EEC component type-approval, and of the reasons for such a measure.

#### Article 6

All decisions taken pursuant to the provisions adopted in implementation of this Directive to refuse or withdraw EEC component type-approval for a driver's seat or prohibit the placing on the market or use thereof shall set out in detail the reasons on which it is based. Such decisions shall be notified to the party concerned, who shall at the same time be informed of the remedies available to him under the laws in force in the Member States and of the time limits allowed for the exercise of such remedies.

#### Article 7

No Member State may refuse to grant EEC type-approval or national type-approval of a tractor on grounds relating to its driver's seat if this bears the EEC component type-approval mark and is fitted in accordance with the requirements laid down in Annex IV.

Article 8

No Member State may refuse or prohibit the sale, the registration, entry into service or use of a tractor on grounds relating to its driver's seat if this bears the EEC component type-approval mark and if it is fitted in accordance with the requirements set out in Annex IV.

Article 9

1. For the purpose of this Directive, "agricultural or forestry tractors" means any motor vehicle, fitted with wheels or endless tracks, having at least two axles, the main function of which lies in its tractive power and which is specially designed to tow, push, carry or power certain tools, machinery or trailers intended for agricultural or forestry use. It may be equipped to carry a load and passengers.
2. This Directive shall only apply to tractors as defined in paragraph 1 above which are fitted with pneumatic tyres and which have two axles and a maximum design speed between 6 and 25 km/h.

Article 10

Any amendments necessary to adjust the requirements of the Annexes to take account of technical progress shall be adopted in accordance with the procedure laid down in Article 13 of Directive 74/150/EEC.

Article 11

1. Member States shall bring into force the provisions necessary in order to comply with this Directive within 18 months of its notification and shall forthwith inform the Commission thereof.

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2. Once this Directive has been notified, Member States shall also ensure that the Commission is informed, in sufficient time for it to submit its comments, of any draft laws, regulations or administrative provisions which they propose to adopt in the field covered by this Directive.

Article 12

This Directive is addressed to the Member States.

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THE DRIVER'S SEAT

ANNEX I

DEFINITIONS

For the purposes of this Directive :

1. "Driver's seat" means the seating provision for the person driving the tractor.
2. "Seat surface" means the almost horizontal area of the seat which supports the driver when seated.
3. "Backrest" means the almost vertical area of the seat supporting the driver's back when seated.
4. "Lateral seat supports" means the devices or forms of the seat surface that prevent the driver from sliding sideways.
- 4.1. "Seat armrests" means the devices on either side of the seat which support the driver's arms when he is seated.
5. "Seat reference point" (SRP) means the point of intersection in the central longitudinal plane of the seat between the tangential plane at the base of the upholstered backrest and a horizontal plane. This horizontal plane intersects the lower surface of the seat 150 mm in front of the seat reference point (see Appendix 1 to Annex II).
6. "Depth of the seat surface" means the horizontal distance between the SPR and the front edge of the seat surface.
7. "Width of the seat surface" means the horizontal distance between the outside edges of the seat surface measured in a plane perpendicular to the central plane of the seat.
8. "Load adjustment range" means the range between the two loads corresponding to the mean positions in the suspension system curves plotted for the heaviest and lightest driver.

9. "Suspension travel" means the movement from the highest to the lowest position in the suspension system.
10. "Vibration" means the vertical movement up and down of the driver's seat.
11. "Vibration acceleration ( $a$ )" means the second differential of the vibration displacement with respect to time.
12. "R.m.s. value of the acceleration ( $a_{eff}$ )" means the square root of the meant square of the accelerations.
13. "Spectral power density ( $\phi$ )" means the limiting value, when  $\Delta b \rightarrow 0$ , of the square of the r.m.s. value measured after a filter of limited pass-band, divided by the band-width of the filter ( $\Delta b$  = width of filter).
14. "Weighted vibration acceleration ( $a_w$ )" means the weighted vibration acceleration determined with the help of weighting filter in accordance with item 2.5.3.3.5.2. of Annex II.
15. "Vibration ratio" means the ratio of the weighted vibration acceleration measured on the driver's seat to that measured at the point of seat attachment.
16. "Vibration class" means the class or group of standard tractors which show the same vibration characteristics.
17. "Standard tractors" means tractors whose characteristics enable them to be classified in one of the vibration classes because of similar constructional features.

17.1. The characteristics of these tractors are as follows :

Number of axles : two

Load distribution :

- front axle : 30 - 45 % of unladen weight
- rear axle : 70 - 55 % of unladen weight;

Tyres : front smaller than rear  
(ratio of tyre radii  $\leq 4:5$ );

Track width : smallest adjustable track width greater than  
1150 mm;

Suspension : rear axle unsprung;

Horizontal position of seat : between rear axle and centre of  
gravity of tractor.

17.2. Tractors of standard design are subdivided into classes :

Class I : 1,400 to 3,600 kg unladen weight

Class II: 3,601 to 5,000 kg unladen weight.

18. "Reference tractor" means a tractor whose vibration behaviour is  
specific for testing a seat for a vibration class.

18.1. The technical data for reference tractors must accord with the  
values shown in the table below :

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	Class I	Class II	Tolerances (*)
Unladen weight in kg	3040	4750	± 5 %
Front axle load in kg	1300	1830	± 5 %
Rear axle load in kg	1740	2920	± 5 %
Front tyres	7.50 - 18	12.4/11-28	
Rear tyres	16.9/14-34	16.9/14-38	
Front tyre pressure in bars (*)	2,0	1,5	+ 0,1 bar
Rear tyre pressure in bars (**)	1,1	1,3	+ 0,1 bar
Wheelbase in mm	2125	2590	± 10 %

(\*) These tolerances must not be exceeded unless it is shown that the spectral power density of the vertical acceleration at the point of seat attachment satisfies the conditions specified in Appendices 9 and 10. of Annex II.

(\*\*) These values are applicable to diagonal tyres; if radials are used, the pressure must be increased by 15 %.

19. "Non-standard tractor" means a tractor whose characteristics are such that it cannot be classified in any vibration class.



ANNEX II

CONSTRUCTION AND TEST SPECIFICATIONS - CONDITIONS FOR EEC TYPE  
APPROVAL AND MARKING

1. GENERAL SPECIFICATIONS

- 1.1. The driver's seat must be designed to ensure a comfortable position for the driver when controlling and manoeuvring the tractor, and to afford him the utmost protection as regards health and safety.
- 1.2. The seat must be adjustable in the longitudinal direction and in the height without the use of a tool.
- 1.3. The requirements under points 1.2 above do not however, apply if the seats are intended for installation in tractors with a minimum width between the rear wheel tracks of 1150 mm or less.
- 1.4. The seat must be adjustable for persons of different weights. Where adjustment is necessary in order to comply with this requirement, it must be carried out without the use of tools.
- 1.5. The seat must be designed to reduce shocks, and vibration. It must therefore be well sprung, have good vibration absorption and provide adequate support at the rear and sides.  
  
The lateral support is considered adequate if the seat is designed to prevent the driver's body from slopping sideways.
- 1.6. The seat surface, the backrest, the lateral supports and the removable, folding or fixed armrests must be upholstered.
- 1.7. The seat reference point (SRP) must be determined in the manner specified in Appendix 1 of Annex II.

- 1.8. Save as otherwise provided, the measurements and tolerances must comply with the following requirements :
- 1.8.1. The measurements given must be expressed in full units and rounded off to the nearest whole number.
- 1.8.2. The instruments used for making measurements must be enable the measured value to be rounded off to the nearest whole unit and must be accurate within the following tolerance limits :
- |                                     |                 |
|-------------------------------------|-----------------|
| for length                          | : $\pm 5\%$     |
| for angle measurements              | : $\pm 1^\circ$ |
| for determination of tractor weight | : $\pm 20$ kg   |
| for measurement of tyre pressure    | : $\pm 0.1$ bar |
- 1.8.3. For all data relating to dimensions, a tolerance of  $\pm 5\%$  is allowed.
- 1.9. The seat must undergo the following tests :
- 1.9.1. Determination of the suspension characteristics and the range of adjustment to the driver's weight.
- 1.9.2. Determination of lateral stability.
- 1.9.3. Determination of vibration.
- 1.10. The seat undergoing the above-mentioned tests must possess the same characteristics with respect to construction and fittings as the seats in series production.
- 1.11. All the tests must be carried out on the same seat in the order specified in point 1.9.
- 1.12. Before the tests are carried out, the seat must have been run in by the manufacturer.
- 1.13. If the requirements specified for one phase of the test are not fulfilled, or if the test seat shows damage that might affect its characteristics, the test must be terminated and the test report must state the test results obtained so far and the reason for termination of the test.
- .../...

- 1.14. Seats tested for Class I tractors are suitable only for tractors of that class, whereas seats tested for Class II tractors are suitable for Class I or Class II tractors.

2. SPECIAL REQUIREMENTS

2.1. Seat surface dimensions

2.1.1. The depth of the seat surface, measured parallel to the longitudinal median of the seat at a distance of 150 mm, must be  $400 \pm 50$  mm (see Fig. below).

2.1.2. The width of the seat surface, measured perpendicular to the median of the seat, 150 mm in front of the SRP and 80 mm above that point, must be at least 450 mm (see Fig. below).

2.1.3. The depth and the width of the surface of seats intended for tractors in which the distance between the rear wheels does not exceed 1 150 mm may be reduced if it is technically impossible to comply with the specifications in items 2.1.1. and 2.1.2. above, namely, 300 mm for the depth and 400 mm for the width.

2.2. Position and inclination of the backrest

2.2.1. The upper edge of the backrest of the seat must be at least 260 mm above the SRP (see Fig. below).

2.2.2. The backrest must have an inclination of  $10^\circ \pm 5^\circ$  (see illustration below).

2.3. Inclination of the seat surface

2.3.1. The inclination towards the rear  $\alpha$  (see figure below) of the surface of the loaded cushion must be  $3-12^\circ$  in relation to the horizontal, measured with the loading device in accordance with Appendix 1.

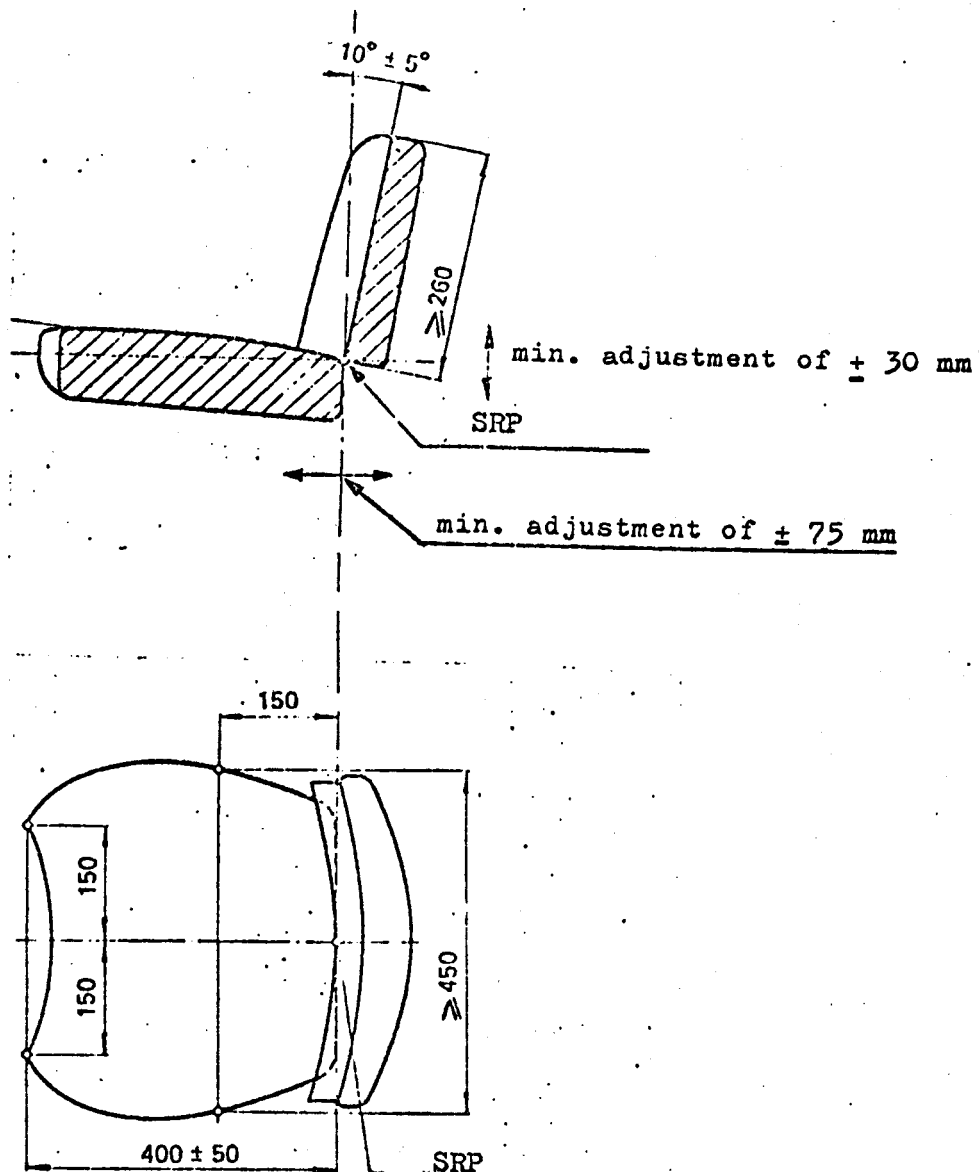
2.3.2. The choice of the angle of inclination within this category shall depend on the seated position.

2.4. Seat adjustment

2.4.1. The seat must be adjustable in the longitudinal direction by a distance of 150 mm (see figure below).

2.4.2. The seat must be adjustable in the vertical direction by a distance of 60 mm (see figure below).

- Figure -



2.5. Seat tests

2.5.1. Test to determine the suspension characteristics and the range of adjustment to the driver's weight

- 2.5.1.1. The suspension system characteristics shall be determined by a static test. This must be carried out with the seat adjusted to accommodate a driver weighing 50 kg and one weighing 120 kg.
- The maximum and minimum values limiting the range through which the seat is adjustable to the driver's weight shall be calculated from the suspension system characteristics.
- 2.5.1.2. The seat shall be mounted on a test stand and a load applied to it, either directly or by means of a special device; the load applied to the seat shall not differ by more than 5 N from the nominal load. The depression of the suspension system shall be measured with an accuracy of not less than  $\pm 1$  mm.

- 2.5.1.3. A complete characteristic curve representing the deflection of the suspension system shall be plotted from zero load to maximum load, and back to zero.

The load graduations at which the depression of the suspension system is measured shall not be greater than 100 N; at least eight measurements points shall be plotted at roughly equal intervals in the movement of the suspension system. The point taken as the maximum load shall be either that at which no further spring depression can be recorded, or load of 1,500 N. After the load has been applied or withdrawn, the vertical depression of the suspension system shall be measured 200 mm in front of the seat reference point; sufficient time shall be allowed after the application or removal of the load to ensure that the seat is at rest.

- 2.5.1.4. In the case of seats without fixed weight adjustment limits, the settings shall be so selected that :

- 2.5.1.4.1. for the lightest driver, the seat returns to the top of the suspension travel when the load is removed; and

- 2.5.1.4.2. for the heaviest driver, the load of 1 500 N just depresses the seat to the lowest limit of the suspension travel. the range of weights thus determined shall then be deemed greater than the range measured.
- 2.5.1.4.3. if the seat is equipped with a progressive lower spring stop, the lowest position of the suspension travel (see Annex I, item 9) may be defined as the position which the seat assumes under a load of 1 000 N, in the setting for the lightest driver.
- 2.5.1.5. The mean position of the suspension system is the position which the seat assumes when it is depressed by half the full travel of the suspension system.
- 2.5.1.6. Since the characteristic curves of the suspension system are generally hysteresis loops, the load must be determined by drawing a centre line through the loop (see Annex I, item 8 and items A and B in Appendix 2 of Annex II.)
- 2.5.1.7. To determine the limits of the adjustment range as a function of the driver's weight, the values of points A and B (see Appendix 2) established in accordance with item 2.5.1.6. must be multiplied by 1.3.
- 2.5.2. Test to determine the lateral stability
- 2.5.2.1. The seat shall be set for the maximum permissible driver's weight and connected to the test stand in such a way that its base plate rests on a fixed plate (test stand) not smaller than the base plate itself.
- 2.5.2.2. A test load of 1 000 N shall be applied to the surface or cushion of the seat. The point of application shall lie 200 mm in front of the seat reference point and alternately on the two sides 150 mm from the plane of symmetry through the seat.

2.5.2.3. During application of the load, the variation in the lateral angle of inclination of the seat surface shall be measured and recorded in the end settings for horizontal and vertical seat adjustment. A permanent deformation close to the point of application of the load shall not be taken into consideration.

2.5.3. Test to determine the vibration

The seat vibration is determined by tests on a standard roadway and/or test stand depending on the type of tractor for which it is intended.

2.5.3.1. Testing on a standard roadway

2.5.3.1.1. The roadway consists of two parallel strips spaced according to the wheeltrack of the tractor. The surface may be cast in smoothly surfaced concrete, or it may be formed of wood or concrete blocks set in a basic structure. The surface of each track strip is defined by the ordinates of elevation in relation to a base line; these ordinates are shown in the tables in Appendix 3. With regard to the roadway, the elevation is defined at intervals of 16 cm along each strip.

The roadway must be firmly set in the ground and the distance between the strips must deviate only slightly over its entire length; the tractors wheels must be fully supported at all times. Where the strips are formed of blocks, these must be 6-8 cm thick and arranged at intervals of 16 cm.

The total length of the track shall be 100 m.

2.5.3.1.2. The vertical vibrations transmitted shall be determined at a speed of  $12 \pm 0.5$  km/h. The prescribed speed must be maintained without the use of brakes. The vibrations shall be measured on the seat (with a light and a heavy driver) and at the point where the seat is attached to the tractor.

The speed of 12 km/h must be reached after a run-up track has been traversed. The surface of this run-up track must be flat and must join the test track without any change in level.

- 2.5.3.1.3. The seat must be set for the driver's weight in accordance with the maker's instructions.
- 2.5.3.1.4. The tractor must be fitted with a protective frame and/or cab save where this equipment is not required. It must not carry any ancillary equipment. Moreover, there must be no ballast on the wheels or framework, and no fluid in the tyres.
- 2.5.3.1.5. The tyres used during the test must have the standard dimensions and ply-rating, as specified in the manufacturer's instructions. The depth of the tread must not be less than 65 % of the depth of a new tread.
- 2.5.3.1.6. The side-walls of the tyres must not be damaged. The internal pressure of the tyre must correspond to the arithmetical mean of the reference pressures recommended by the tyre manufacturer. The wheel track must correspond to that used under normal working conditions for the tractor model on which the seat is fitted.
- 2.5.3.1.7. The measurements at the point of seat attachment and on the seat itself may be made during the same run or on separate runs.  
For measuring and recording the vibrations, an accelerometer, a measuring amplifier and a magnetic tape recorder or direct-reading vibration meter shall be used. The specifications for these instruments are laid down in points 2.5.3.3.2. to 2.5.3.3.6.

## 2.5.3.2. Testing on the test stand

- 2.5.3.2.1. The test stand must simulate the vertical vibrations at the point of attachment of the driver's seat. The vibrations are generated by means of an electro-hydraulic device. The set values are either those specified in Appendices 4 and 5 for the ..//..



class of tractor in question, or the double-integrating acceleration signals recorded at the seat attachment of a non-standard tractor moving at a speed of  $12 \pm 0.5$  km/h on a standard roadway as defined in point 2.5.3.1.1. The vibrations must be transmitted to a platform which roughly corresponds in its dimensions to the driver's cab of a tractor. To generate the vibrations, an uninterrupted double run of the seat values or the double-integrating acceleration signals must be used, recorded at the seat attachment of a non-standard tractor type moving on standard track. The measurements must not be made during the first run of the set values or of the acceleration signal.

2.5.3.2.2 Besides an attachment for the test seat, the platform must contain a steering wheel and footrest. Its configuration must be as shown in Appendix 6.

2.5.3.2.3 The test stand must have a high degree of flexural and torsional rigidity, and its bearings and guides must have no more than the technically necessary clearance. If the platform is carried on a vibrating arm, the dimension R must be at least 2,000 mm (see Appendix 6).

The test stand must be able to simulate sinusoidal vibrations, as shown in Appendix 7, when a weight of 150 kg is applied.

2.5.3.3. Specifications for tests on roadway and test stand

2.5.3.3.1 Driver's weight

The tests must be carried out with two drivers : one with a total weight of  $55 \text{ kg} \pm 10 \%$ , of which not more than 5 kg may be carried in a weighting belt around the body; the other weighing of 98 ( $\pm 10 \%$ ), with a maximum weight of 8 kg in the belt.

.../...

2.5.3.3.2. Position of the accelerometer

To measure the vibrations transmitted to the driver, an accelerometer shall be placed on a rigid and flat plate with a diameter of 250 mm  $\pm$  50 mm, the central part of which must be rigid up to a diameter of 75 mm and must include a rigid protective device to protect the accelerometer. This plate must be placed in the middle of the seat surface between the seat and the driver and have a foam rubber covering about 20 mm thick.

To measure the vibrations of the seat attachment, an accelerometer must be placed on this attachment at a point not more than 100 mm from the longitudinal median plane of the tractor and not outside the vertical projection of the seat surface on the tractor.

2.5.3.3.3. Measurement of vibration acceleration

The accelerometer and the associated amplifying and transmitting equipment must respond to vibrations with an r.m.s. value of 0.05 m/s<sup>2</sup>, and be capable of measuring vibrations with an r.m.s. value of 5 m/s<sup>2</sup> and a crest factor (ratio of peak to r.m.s. value) of 3 without distortion and with a maximum error of 2.5. % over the range 1-80 Hz.

2.5.3.3.4. Magnetic tape recorder

If a tape recorder is used, it must have a maximum reproduction error of  $\pm$  3.5.% in frequency range of 1-80 Hz, including change of tape speed during replay for analysis.

2.5.3.3.5. Vibration meter

2.5.3.3.5.1. Vibrations of more than 10 Hz may be disregarded. It is therefore permissible to connect upstream of the measuring instrument a low-pass filter with a cut-out frequency of about 10 Hz and an attenuation of 12 dB per octave.

2.5.3.3.5.2. This instrument must incorporate an electronic weighting filter between the sensor and the integrator stage. The filter must correspond to the curve shown in Appendix 8 and the margin of error must be  $\pm 0.5$  dB in the 2-4 Hz frequency band and  $\pm 2$  dB for the other frequencies.

2.5.3.3.5.3. The integrator stage must be capable of indicating either - the integral of the square of the weighted vibration acceleration ( $a_w$ ) for a test time T

$$I = \int_0^T a_w^2 dt$$

- or the square root of that integral, except where it directly indicates the r.m.s. value of the weighted vibration acceleration ( $a_{weff}$ )

$$a_{weff} = \sqrt{I/T} = \frac{\sqrt{I}}{\sqrt{T}}$$

The overall inaccuracy in the r.m.s. value of the weighted acceleration calculated in this way must be within  $\pm 5$  %.

2.5.3.3.6. Calibration

All instruments must be regularly calibrated.

2.5.3.3.7. Evaluation of vibration tests

2.5.3.3.7.1. During each test, the weighted vibration acceleration for the whole test time shall be determined with the direct-reading vibration meter specified in point 2.5.3.3.5.

2.5.3.3.7.2. In addition to the pairs of mean values relating to the vibration of the tractor or the seat, the test report shall also contain the ratio of the weighted vibration acceleration on the driver's seat to that measured at the seat attachment. This ratio shall be given to two decimal points.

2.5.3.7.3. The range of ambient temperature during the tests shall be measured and shown in the report.

2.5.4. Tests to be carried out on tractor seats depending on the intended use

2.5.4.1. A seat intended for use on a standard tractor must be tested either on a standard roadway with the aid of a reference tractor appropriate to the class of the standard tractor in question or on a vibration test stand using the appropriate set value signals.

If the test of a seat intended for use in a standard tractor is carried out on a standard roadway with a reference tractor, the test is valid for the entire tractor class. If, however, the test is carried out with the tractor for which the seat is intended, it is valid only for that particular combination of seat and tractor.

2.5.4.2. A seat intended for use on a non-standard tractor must be tested on a standard roadway with the tractor on which it is to be used. However, a simulation test may also be carried out using a set value signal corresponding to the acceleration curve which was determined during the test on standard roadway with the tractor for which the seat is intended.

2.5.4.3. A seat intended for use only on a particular standard tractor may also be tested in accordance with the requirements under point 2.5.4.2. above; in this case, type approval will be granted only for the tractor for which the test seat is intended.

2.5.5. Special requirements for seat vibration tests on standard tractors

2.5.5.1. The vibration behaviour of the reference tractor, which is the critical factor in the test on the driver's seat, is defined by the spectral power density of the vertical acceleration (Appendices 9 and 10) recorded at the

.../...

seat attachment of the reference tractor during a run on the standard roadway in accordance with the provisions of point 2.5.3.1.

2.5.5.2. The weighted acceleration measured at the seat attachment during the test run of the reference tractor must lie within the following ranges :

For Class I reference tractors :

$$a_{wB} = 1.9 \dots\dots\dots 2.2 \text{ m/s}^2$$

For Class II reference tractors :

$$a_{wB} = 1.6 \dots\dots\dots 1.8 \text{ m/s}^2$$

The value  $a_{wB}$  actually present at the seat attachment during the measurement run must be determined. In case of deviation from the reference value of :

$$a_{wB}^* = 2.05 \text{ m/s}^2 \text{ for Class I}$$

$$a_{wB}^* = 1.7 \text{ m/s}^2 \text{ for Class II,}$$

the acceleration of  $a_{ws}$  measured on the driver's seat must be corrected in accordance with the relation :

$$a_{ws}^* = a_{ws} \times \frac{a_{wB}^*}{a_{wB}}$$

2.5.5.3. In each phase of the standard roadway test, at least two measurement runs must be carried out. The measured values must not deviate from the arithmetic mean by more than  $\pm 5\%$ .

2.5.5.4. In the case of the test carried out on the stand, the set value signals for the generation of the vertical movement of the seat attachment must have been determined by double integration of the acceleration signals recorded at the seat attachment of Class I or II reference tractors during a run on the standard roadway. They are given in Appendices 4 and 5. The test stand must be so adjusted that the seat attachment is subjected to a weighted acceleration of :

$$a_{wB} = 1.9 \dots\dots\dots 2.2 \text{ m/s}^2 \quad \dots/\dots$$

for Class I standard tractors, and

$$a_{WB} = 1.6 \dots\dots\dots 1.8 \text{ m/s}^2$$

for Class II standard tractors

The value  $a_{WB}$  actually present at the seat attachment during measurement must be determined. In case of deviation from the reference value of :

$$a_{WB}^* = 2.05 \text{ m/s}^2 \text{ for Class I standard tractors}$$

$$a_{WB}^* = 1.7 \text{ m/s}^2 \text{ for Class II standard tractors,}$$

the acceleration of  $a_{ws}$  measured at the driver's seat must be corrected in accordance with the following equation :

$$a_{WB}^* = a_{ws} \frac{a_{WB}^*}{a_{WB}}$$

2.5.5.5. For the test on the stand, the requirements under point 2.5.3.2. are applicable, and the vibration must be generated in accordance with the requirements under point 2.5.5.2.

For each of the two drivers referred to in points 2.5.3.3.1., the weighted vibration acceleration must be measured at the seat over a period of 28 seconds. At least two test runs must be carried out. The measured values must not deviate from the arithmetic mean by more than  $\pm 5\%$ .

2.5.6. Special requirements for vibration tests on seats of non-standard tractors

2.5.6.1. In accordance with the requirements under point 2.5.4.2., the seat vibration tests are not applicable to a group or class of tractors, but each tractor type for which the seat is intended.

2.5.6.2. The test on standard track must be carried out in accordance with the requirements under items 2.5.3.1. and 2.5.3.3. In this case, the vibratory acceleration measured on the driver's seat ( $a_{ws}$ ) need not be corrected and is accordingly identical with the reference value  $a_{ws}^*$ .

2.5.6.3. The testing on the test stand must be carried out in association with a test on standard track in accordance with the requirements of points 2.5.3.2. and 2.5.3.3.

The set points for vibration rig drive unit shall be determined by double integration of the vibratory movement acceleration signal recorded in accordance with point 2.5.3.2.1.

2.5.6.4. In the determination of the set values obtained in accordance with the provisions of 2.5.6.3. above, the weighted vibration acceleration ( $A_{wp}$ ) recorded on the test stand at the seat attachment must not deviate by more than  $\pm 10\%$  from the value ( $a_{wF}$ ) recorded on the standard roadway in accordance with the requirements under 2.5.6.3. above. In the event of deviation from the value ( $A_{wF}$ ) measured at the seat attachment during the test run, the weighted vibration acceleration recorded at the driver's seat during the test on the test stand must be corrected as follows :

$$a_{WS}^* = a_{WS} \times \frac{a_{wF}}{a_{wp}}$$

Each of the tests on the test stand must be carried out twice. The measured values must not deviate by more than  $\pm 5\%$  from the arithmetic mean.

### 3. PROVISIONS RELATING TO EEC TYPE-APPROVAL AND MARKING

#### 3.1. Conditions for EEC type-approval of a seat

In order to qualify for EEC type-approval, a seat must, in addition to fulfilling the requirements set out above, satisfy the following conditions :

3.1.1. The maximum range of adjustment for the driver's weight must extend from at least 50 to 120 kg.

3.1.2. The change in the angle of inclination measured during the lateral stability test must not exceed  $5^\circ$ .

3.1.3. The corrected measured value of the weighted vibration acceleration ( $a_{ws}^*$ ) must not exceed  $1.25 \text{ m/s}^2$ . None of the measurements must deviate from the arithmetic mean by more than  $\pm 5 \%$ .

3.2. Application for EEC type-approval

3.2.1. The application for EEC type-approval shall be submitted by the owner of the trademark or by his authorized representative.

3.2.2. For each type of driver's seat, the application shall be accompanied by :

3.2.2.1. a brief technical description, stating in particular the tractor or tractors for which it is intended,

3.2.2.2. drawings in triplicate, sufficiently detailed to permit identification of the type of seat and showing in particular its dimensions, its weight, its suspension system and its means of attachment,

3.2.2.3. at least one seat,

3.2.2.4. one tractor (if necessary) representative of the type of tractor for which the seat is intended.

3.3. Inscriptions

3.3.1. The seat submitted for EEC type-approval must bear the applicant's trademark, clearly and indelibly inscribed.

3.3.2. On each seat there must be an area large enough for the EEC type-approval mark; this area must be shown on the drawings referred to in point 3.2.2.2. above.

3.4. EEC type-approval

3.4.1. If the seat submitted in accordance with the provisions of point 3.2. complies with the requirements of points 3.1. and 3.3., EEC type-approval will be granted and a type-approval number allocated.

3.4.2. This number must not be allocated to any other type of seat.



3.5. Marking

3.5.1. Every seat that conforms to a type approved in pursuance of this Directive must bear an EEC type-approval mark.

3.5.2. The type-approval mark shall consist of a rectangle, within which shall be placed the letter "e" followed by the distinguishing number or letter of the Member State which has granted type-approval :

- 1 for Germany
- 2 for France
- 3 for Italy
- 4 for the Netherlands
- 6 for Belgium
- 11 for the United Kingdom
- 13 for Luxembourg
- 18 for Denmark
- IRL for Ireland,

an EEC type-approval number corresponding to the number of the EEC approval certificate issued for the type of seat, below and close to the rectangle and the mark, and, above and close to the rectangle, the type of tractor of standard model for which the seat is intended. This mark shall be :

For Category I standard model tractors : I

For Category II standard model tractors : II

For Categories I and II standard model tractors : I & II.

If no mark is shown above the rectangle, this means that the seat is intended for a non-standard model tractor.

3.5.3. The EEC type-approval mark shall be affixed to the seat in such a way that it is indelible and clearly legible even when the seat is mounted on the tractor.

3.5.4. An example of the type-approval mark is given in Appendix 11.

3.5.5. The dimensions of the various components of this mark shall not be smaller than the minimum dimensions specified for marking as illustrated in Appendix 11.

METHOD OF DETERMINING THE SEAT REFERENCE POINT

1. DEFINITION OF THE REFERENCE POINT

The reference point is defined as the point in the median longitudinal plane of the seat where the plane tangential to the lower part of the padded 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.

2. DEVICE FOR DETERMINING THE SEAT REFERENCE POINT

The device (Figure 1) should consist of a seat-pan board and the components of a padded backrest. The lower part of the padded backrest shall be jointed in the region of the ischium humps (A) and the loin (B), the joint (B) being adjustable in height.

3. METHOD OF DETERMINING THE SEAT REFERENCE POINT

The seat reference point shall be obtained by using the device illustrated in Figures 1 and 2, which simulated loading by a human occupant. The device shall be positioned on the seat. It shall then be loaded with a force of 550 N at a point 50 mm in front of joint (A) and two parts of the padded backrest lightly pressed tangentially against the padded backrest.

If it is not possible to determine definite tangents to each area of the padded backrest (below and above the lumbar region) the following procedure shall be adopted :

a) No definite tangent to the lower area possible :

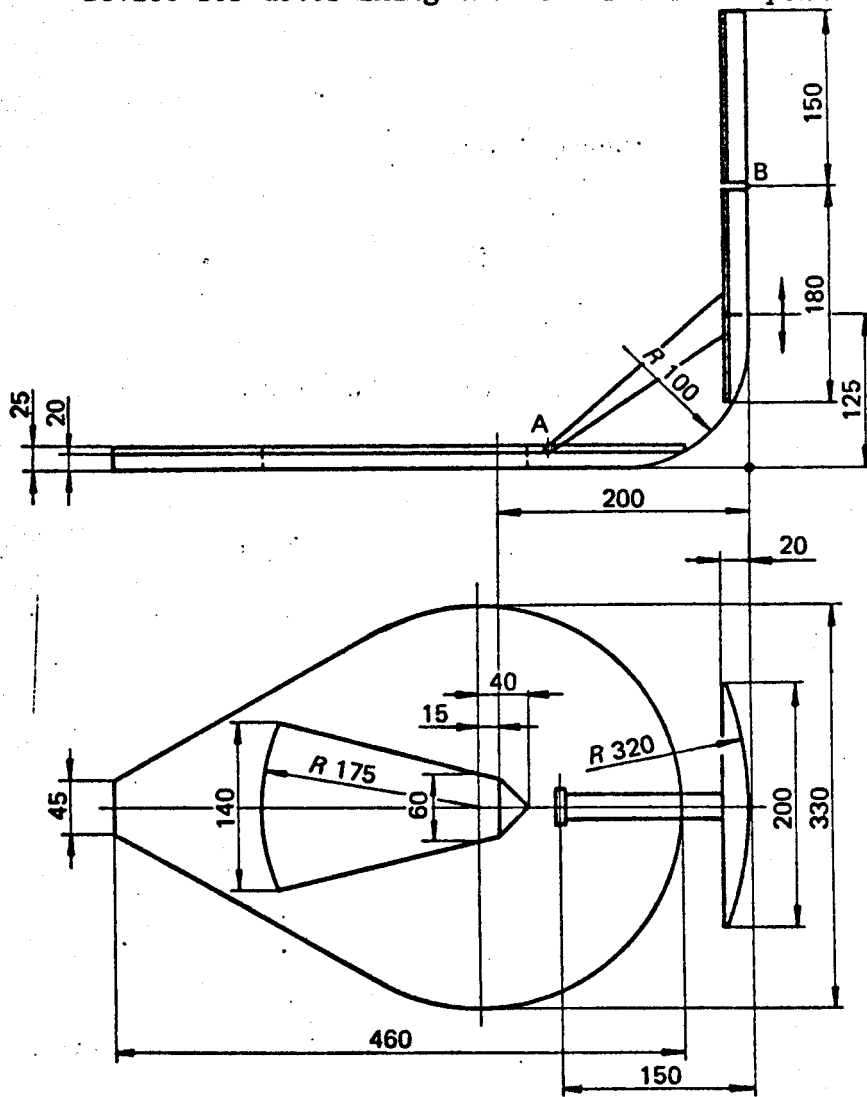
The lower part of the padded backrest board in a vertical position shall be lightly pressed against the backrest.

b) No definite tangent to the upper area possible :

The joint (B) shall be fixed at a height of 230 mm above the seat reference point if the lower part of the padded backrest board is vertical. Then the two parts of the padded backrest board in a vertical position shall be lightly pressed against the padded backrest.

**FIGURE 1**

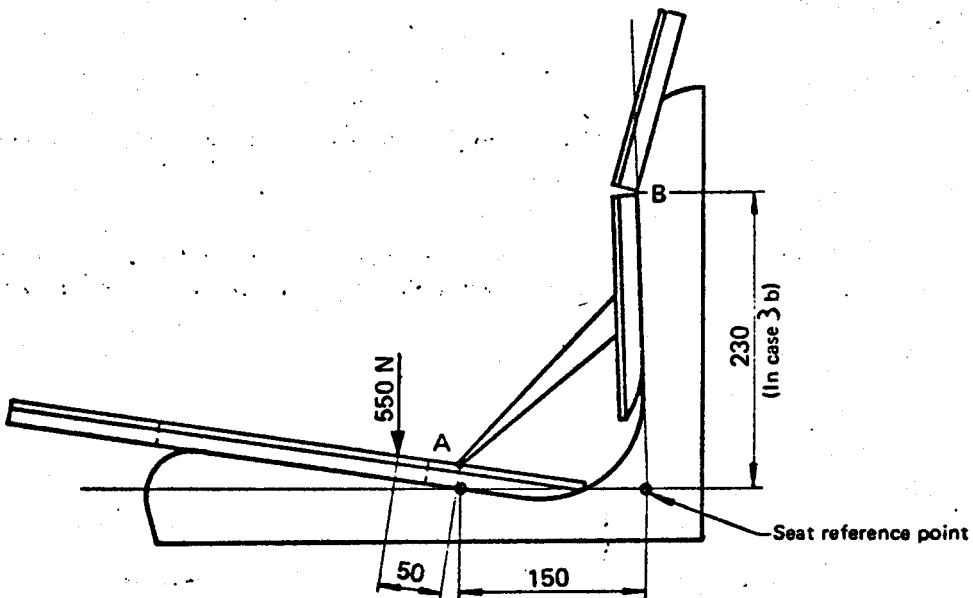
Device for determining the seat reference point



Dimensions in millimeters

**FIGURE 2**

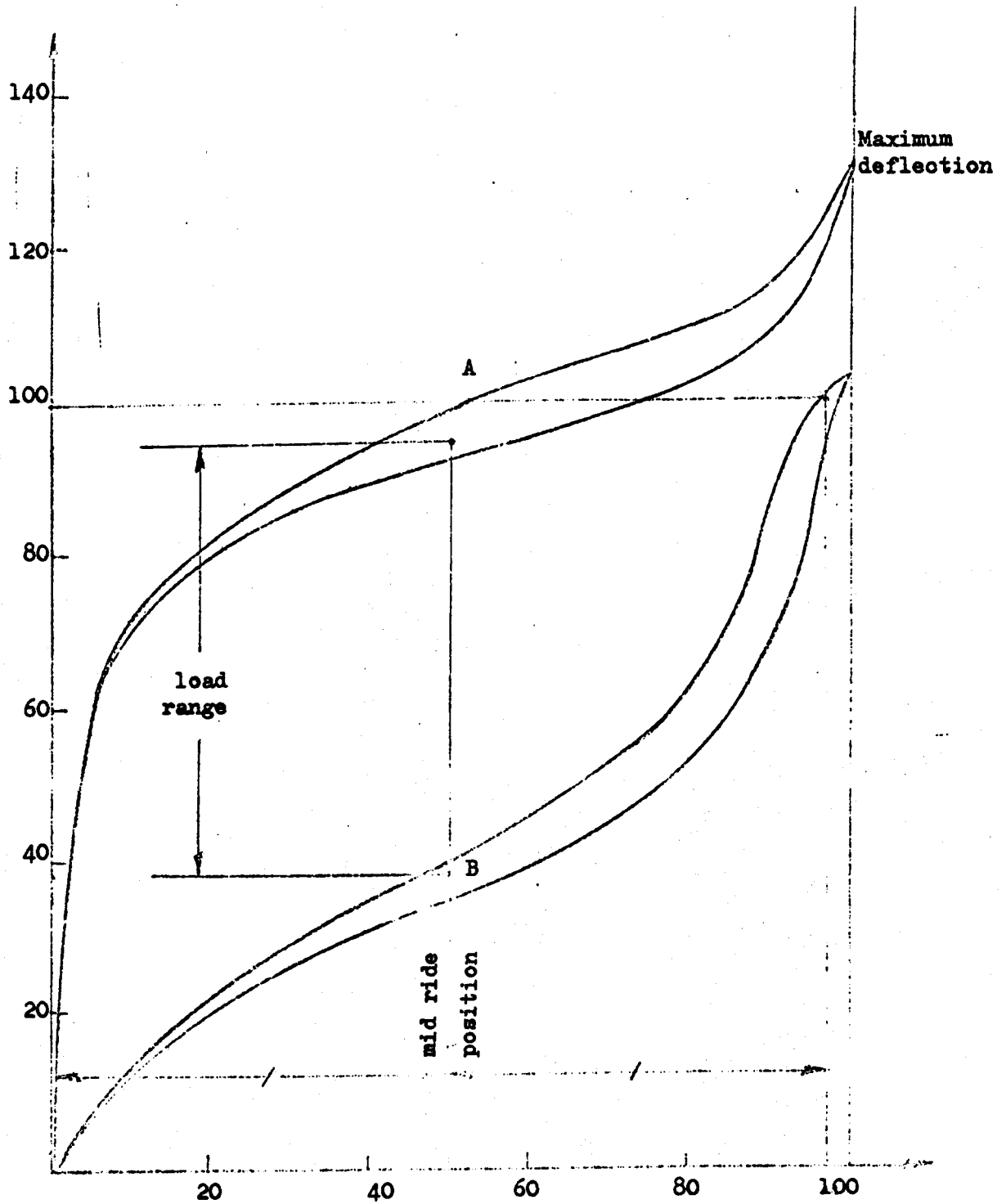
Device in position



Annex II

TEST TO DETERMINE THE CHARACTERISTICS OF THE SUSPENSION SYSTEM

Hysteresis curves to determine the maximum adjustment range  
(point 2.5.1.)



TEST ON STANDARD ROADWAY - TABLE OF ELEVATION ORDINATES IN RELATION  
TO AN ARBITRARY BASIC LEVEL DEFINING THE SURFACE OF EACH STRIP OF  
THE ROADWAY (POINT 2.5.3.1.1.)

D = distance from starting point (metres)  
L = ordinate of the left-hand strip (mm)  
R = ordinate of the right-hand strip (mm)

D	L	R	D	L	R	D	L	R	D	L	R
0	115	140	9,60	135	95	19,20	95	70	28,80	90	75
0,16	110	125	9,76	120	95	19,36	85	70	28,96	75	90
0,32	110	140	9,92	120	95	19,52	85	75	29,12	75	75
0,48	115	135	10,08	120	95	19,68	75	85	29,28	75	75
0,64	120	135	10,24	115	85	19,84	85	85	29,44	70	75
0,80	120	125	10,40	115	90	20,00	75	90	29,60	75	75
0,96	125	135	10,56	115	85	20,16	85	85	29,76	75	85
1,12	120	125	10,72	115	90	20,32	75	70	29,92	85	75
1,28	120	115	10,88	120	90	20,48	70	75	30,08	75	75
1,44	115	110	11,04	110	75	20,64	65	75	30,24	85	75
1,60	110	100	11,20	110	75	20,80	70	75	30,40	75	75
1,76	110	110	11,36	100	85	20,96	65	75	30,56	70	75
1,92	110	110	11,52	110	85	21,12	70	75	30,72	75	75
2,08	115	115	11,68	95	90	21,28	70	85	30,88	85	75
2,24	110	110	11,84	95	90	21,44	70	85	31,04	90	75
2,40	100	110	12,00	95	85	21,60	70	90	31,20	90	85
2,56	100	100	12,16	100	95	21,76	75	95	31,36	100	75
2,72	95	110	12,32	100	90	21,92	75	95	31,52	100	75
2,88	95	95	12,48	95	85	22,08	75	90	31,68	120	85
3,04	90	95	12,64	95	85	22,24	85	90	31,84	115	75
3,20	90	100	12,80	95	90	22,40	85	95	32,00	120	85
3,36	85	100	12,96	85	90	22,58	90	85	32,16	120	85
3,52	90	100	13,12	85	85	22,72	90	85	32,32	135	90
3,68	90	115	13,28	75	90	22,88	95	85	32,48	145	95
3,84	95	110	13,44	75	95	23,04	95	85	32,64	160	95
4,00	90	110	13,60	75	90	23,20	100	85	32,80	165	90
4,16	90	95	13,76	70	75	23,36	100	75	32,96	155	90
4,32	95	100	13,92	70	90	23,52	110	85	33,12	145	90
4,48	100	100	14,08	70	100	23,68	110	85	33,28	140	95
4,64	100	90	14,24	70	110	23,84	110	85	33,44	140	85
4,80	90	90	14,40	65	95	24,00	100	75	33,60	140	85
4,96	90	90	14,56	65	100	24,16	100	75	33,76	125	75
5,12	95	90	14,72	65	90	24,32	95	70	33,92	125	75
5,28	95	70	14,88	65	90	24,48	100	70	34,08	115	85
5,44	95	65	15,04	65	85	24,64	100	70	34,24	120	75
5,60	90	50	15,20	55	85	24,80	115	75	34,40	125	75
5,76	95	50	15,36	65	85	24,96	110	75	34,56	115	85
5,92	85	50	15,52	65	85	25,12	110	85	34,72	115	75
6,08	85	55	15,68	55	75	25,28	100	75	34,88	115	90
6,24	75	55	15,84	55	85	25,44	110	95	35,04	115	100
6,40	75	55	16,00	65	75	25,60	100	95	35,20	120	100
6,56	70	65	16,16	55	85	25,76	115	100	35,36	120	100
6,72	75	75	16,32	50	75	25,92	115	100	35,52	135	95
6,88	65	75	16,48	55	75	26,08	110	95	35,68	135	95
7,04	65	85	16,64	65	75	26,24	115	95	35,84	135	95
7,20	65	90	16,80	65	75	26,40	110	95	36,00	135	90
7,36	75	95	16,96	65	85	26,56	100	95	36,16	120	75
7,52	75	100	17,12	65	70	26,72	100	95	36,32	115	75
7,68	95	95	17,28	65	65	26,88	100	100	36,48	110	70
7,84	115	110	17,44	65	75	27,04	100	95	36,64	100	65
8,00	115	100	17,60	65	75	27,20	100	95	36,80	110	55
8,16	125	110	17,76	50	75	27,36	110	90	36,96	115	55
8,32	110	100	17,92	55	85	27,52	115	90	37,12	100	50
8,48	110	100	18,08	55	85	27,68	115	85	37,28	115	50
8,64	110	95	18,24	65	85	27,84	110	90	37,44	110	50
8,80	110	95	18,40	70	75	28,00	110	85	37,60	100	65
8,96	110	95	18,56	75	75	28,16	110	85	37,76	90	55
9,12	110	100	18,72	95	75	28,32	100	85	37,92	95	55
9,28	125	90	18,88	90	75	28,48	100	90	38,08	90	35
9,44	120	100	19,04	90	70	28,64	90	85	38,24	90	35

D	L	R	D	L	R	D	L	R	D	L	R
38,40	110	35	48,00	75	85	57,60	95	115	67,20	55	100
38,56	100	35	48,16	90	95	57,76	85	110	67,36	65	100
38,72	115	35	48,32	95	95	57,92	90	115	67,52	50	100
38,88	100	35	48,48	100	120	58,08	90	110	67,68	50	85
39,04	100	35	48,64	110	100	58,24	90	100	67,84	50	90
39,20	110	30	48,30	115	100	58,40	85	95	68,00	50	100
39,36	110	45	48,96	115	115	58,56	90	95	68,16	55	100
39,52	110	50	49,12	120	115	58,72	85	90	68,32	55	95
39,68	100	55	49,28	120	110	58,88	90	90	68,48	65	90
39,84	110	50	49,44	115	95	59,04	90	95	68,64	50	85
40,00	90	55	49,60	115	90	59,20	90	115	68,80	50	70
40,16	85	55	49,76	115	90	59,36	90	115	68,96	50	70
40,32	90	65	49,92	110	95	59,52	90	115	69,12	50	65
40,48	90	65	50,08	110	100	59,68	85	110	69,28	50	55
40,64	90	70	50,24	100	110	59,84	75	110	69,44	45	50
40,80	95	75	50,40	100	120	60,00	90	115	69,60	35	50
40,96	95	75	50,56	95	120	60,16	90	120	69,76	35	55
41,12	95	75	50,72	95	115	60,32	90	120	69,92	35	65
41,28	90	90	50,88	95	120	60,48	90	120	70,08	35	65
41,44	90	95	51,04	95	120	60,64	95	120	70,24	35	65
41,60	85	95	51,20	90	135	60,80	95	120	70,40	35	55
41,76	85	100	51,36	95	125	60,96	90	120	70,56	45	55
41,92	90	100	51,52	95	120	61,12	90	115	70,72	50	55
42,08	90	95	51,68	100	120	61,28	95	110	70,88	50	50
42,24	85	100	51,84	100	120	61,44	95	110	71,04	50	45
42,40	85	110	52,00	100	120	61,60	100	100	71,20	50	45
42,56	95	110	52,16	100	125	61,76	110	100	71,36	50	50
42,72	95	115	52,32	110	125	61,92	100	100	71,52	45	45
42,88	95	115	52,48	110	125	62,08	100	100	71,68	45	55
43,04	100	100	52,64	100	125	62,24	95	100	71,84	55	65
43,20	100	95	52,80	100	120	62,40	95	100	72,00	55	65
43,36	100	95	52,96	100	120	62,56	95	100	72,16	70	65
43,52	100	90	53,12	110	115	62,72	90	100	72,32	70	75
43,68	110	95	53,28	100	110	62,88	90	100	72,48	75	85
43,84	100	100	53,44	110	110	63,04	90	100	72,64	75	85
44,00	110	90	53,60	95	110	63,20	90	90	72,80	75	90
44,16	100	85	53,76	95	110	63,36	90	90	72,96	85	95
44,32	110	90	53,92	100	110	63,52	85	90	73,12	90	100
44,48	110	85	54,08	95	100	63,68	85	90	73,28	90	110
44,64	100	85	54,24	100	100	63,84	75	85	73,44	90	115
44,80	100	90	54,40	100	100	64,00	75	85	73,60	90	120
44,96	95	90	54,56	100	100	64,16	75	75	73,76	90	115
45,12	90	95	54,72	95	100	64,32	75	75	73,92	90	115
45,28	90	100	54,88	100	100	64,48	70	75	74,08	110	115
45,44	95	100	55,04	100	115	64,64	70	70	74,24	100	110
45,60	90	90	55,20	110	115	64,80	70	55	74,40	100	110
45,76	85	90	55,36	100	110	64,96	70	45	74,56	100	110
45,92	75	90	55,52	110	100	65,12	65	55	74,72	95	115
46,08	85	90	55,68	100	110	65,28	65	55	74,88	95	120
46,24	75	90	55,84	100	110	65,44	65	65	75,04	95	125
46,40	75	90	56,00	100	110	65,60	55	70	75,20	95	135
46,56	75	90	56,16	95	115	65,76	55	75	75,36	100	135
46,72	85	90	56,32	90	110	65,92	55	75	75,52	100	140
46,88	85	85	56,48	95	110	66,08	55	75	75,68	100	140
47,04	90	85	56,64	95	110	66,24	55	85	75,84	100	140
47,20	75	85	56,80	90	100	66,46	55	85	76,00	110	135
47,36	65	75	56,96	100	100	66,56	65	90	76,16	100	125
47,52	70	70	57,12	100	95	66,72	70	90	76,32	100	125
47,68	70	75	57,28	95	100	66,88	70	110	76,48	100	125
47,84	70	75	57,44	100	100	67,04	65	100	76,64	110	125



D	L	R	D	L	R	D	L	R	D	L	R
76,80	115	125	83,20	100	120	89,60	100	120	95,00	100	125
76,96	120	125	83,36	100	125	89,76	100	135	96,16	95	125
77,12	120	125	83,52	100	120	89,92	110	140	96,32	95	125
77,28	120	135	83,68	100	135	90,08	110	135	96,48	95	125
77,44	110	125	83,84	95	140	90,24	110	140	96,64	110	125
77,60	100	125	84,00	100	135	90,40	100	145	96,80	95	120
77,76	120	135	84,16	110	140	90,56	100	155	96,96	95	120
77,92	120	125	84,32	110	140	90,72	110	155	97,12	95	120
78,08	120	125	84,48	110	140	90,88	110	155	97,28	95	110
78,24	115	125	84,64	110	140	91,04	100	155	97,44	100	115
78,40	115	120	84,80	120	155	91,20	110	155	97,60	110	120
78,56	115	120	84,96	115	145	91,36	110	160	97,76	110	115
78,72	110	120	85,12	115	155	91,52	115	160	97,92	100	115
78,88	100	120	85,28	120	160	91,68	110	155	98,08	95	115
79,04	100	120	85,44	120	165	91,84	115	155	98,24	100	115
79,20	95	120	85,60	120	160	92,00	115	140	98,40	95	115
79,36	95	120	85,76	125	165	92,16	115	155	98,52	100	115
79,52	95	125	85,92	135	160	92,32	120	155	98,72	100	110
79,68	95	125	86,08	135	160	92,48	125	145	98,88	110	100
79,84	100	120	86,24	125	155	92,64	125	155	99,04	95	95
80,00	95	125	86,40	125	155	92,80	125	155	99,20	90	100
80,16	95	125	86,56	120	145	92,96	120	155	99,36	90	100
80,32	95	125	86,72	120	145	93,12	120	145	99,52	75	110
80,48	100	120	86,88	110	140	93,28	120	145	99,68	75	115
80,64	100	125	87,04	110	140	93,44	115	145	99,84	75	115
80,80	100	125	87,20	110	140	93,60	120	145	100,00	75	110
80,96	110	125	87,36	110	140	93,76	115	140			
81,12	115	135	87,52	110	140	93,92	115	140			
81,28	110	140	87,68	100	135	94,08	115	140			
81,44	115	140	87,84	100	135	94,24	115	140			
81,60	110	140	88,00	100	135	94,40	115	140			
81,76	115	140	88,16	100	125	94,56	115	140			
81,92	110	140	88,32	110	120	94,72	115	135			
82,08	110	140	88,48	115	120	94,88	115	135			
82,24	110	135	88,64	110	120	95,04	110	135			
82,40	110	135	88,80	110	125	95,20	110	135			
82,56	100	125	88,96	100	125	95,36	110	135			
82,72	110	125	89,12	100	125	95,52	115	135			
82,88	110	125	89,28	95	125	95,68	100	140			
83,04	100	125	89,44	95	125	95,84	95	135			

Set-value signals for the test-stand testing of driver's seats for  
Class I standard tractors (point 2.5.3.2.1.)

PS = set point

a = amplitude of the required value signal in  $10^{-4}$  m,

t = measurement time in seconds

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These signals are shown in the table for 700 required points.

They can be stored numerically and, after passing through a low-pass filter with a cut-off frequency of about 10 Hz and high-frequency attenuation of 12 dB/octave, they show the amplitude of the set value for the electro-hydraulically controlled test stand. The set-value signals must be repeated without interruption.

PS No.	a 10 <sup>-4</sup> m	t s	PS No.	a 10 <sup>-4</sup> m	t s	PS No.	a 10 <sup>-4</sup> m	t s	PS No.	a 10 <sup>-4</sup> m	t s
1	0 344	0	65	-0 211		129	0 025		193	0 342	
2	0 333	0,04	66	-0 180		130	0 074		194	0 330	
3	0 272	0,08	67	-0 182		131	0 106		195	0 265	
4	0 192		68	-0 210		132	0 115		196	0 184	
5	0 127		69	-0 222		133	0 090		197	0 119	
6	0 115		70	-0 210		134	0 048		198	0 105	
7	0 169		71	-0 186		135	0 038		199	0 128	
8	0 243		72	-0 141		136	0 056		200	0 174	
9	0 298		73	-0 038		137	0 116		201	0 215	8,0
10	0 320		74	-0 033		138	0 180		202	0 229	
11	0 270		75	0 000	3,0	139	0 229		203	0 221	
12	0 191		76	0 001		140	0 212		204	0 199	
13	0 124		77	-0 040		141	0 157		205	0 164	
14	0 057		78	-0 098		142	0 097		206	0 162	
15	0 027		79	-0 130		143	0 055		207	0 174	
16	0 004		80	-0 115		144	0 073		208	0 210	
17	-0 013		81	-0 068		145	0 175		209	0 242	
18	-0 039		82	-0 036		146	0 287		210	0 270	
19	-0 055		83	-0 032		147	0 320		211	0 285	
20	-0 056		84	-0 050		148	0 406		212	0 285	
21	-0 059		85	-0 052		149	0 338		213	0 258	
22	-0 068		86	-0 039		150	0 238		214	0 223	
23	-0 104		87	-0 011		151	0 151	6,0	215	0 194	
24	-0 134		88	0 014		152	0 030		216	0 165	
25	-0 147		89	0 041		153	0 090		217	0 132	
26	-0 144	1,0	90	0 054		154	0 146		218	0 106	
27	-0 143		91	0 040		155	0 196		219	0 077	
28	-0 155		92	0 006		156	0 230		220	0 065	
29	-0 179		93	-0 000		157	0 222		221	0 073	
30	-0 181		94	0 025		158	0 184		222	0 099	
31	-0 155		95	0 055		159	0 147		223	0 114	
32	-0 139		96	0 076		160	0 115		224	0 111	
33	-0 141		97	0 054		161	0 114		225	0 083	
34	-0 170		98	-0 016		162	0 140		226	0 026	9,0
35	-0 221		99	-0 066		163	0 198		227	-0 028	
36	-0 259		100	-0 048		164	0 257		228	-0 052	
37	-0 281		101	-0 011	4,0	165	0 281		229	-0 069	
38	-0 268		102	0 061		166	0 276		230	-0 077	
39	-0 258		103	0 131		167	0 236		231	-0 067	
40	-0 285		104	0 168		168	0 201		232	-0 095	
41	-0 348		105	0 161		169	0 167		233	-0 128	
42	-0 437		106	0 131		170	0 145		234	-0 137	
43	-0 509		107	0 086		171	0 135		235	-0 144	
44	-0 547		108	0 067		172	0 165		236	-0 131	
45	-0 562		109	0 088		173	0 242		237	-0 155	
46	-0 550		110	0 110		174	0 321		238	-0 208	
47	-0 550		111	0 148		175	0 399		239	-0 266	
48	-0 576		112	0 153		176	0 411	7,0	240	-0 285	
49	-0 622		113	0 139		177	0 373		241	-0 276	
50	-0 669		114	0 119		178	0 281		242	-0 205	
51	-0 689	2,0	115	0 099		179	0 179		243	-0 110	
52	-0 634		116	0 091		180	0 109		244	-0 020	
53	-0 542		117	0 078		181	0 094		245	0 041	
54	-0 429		118	0 059		182	0 135		246	0 053	
55	-0 314		119	0 062		183	0 205		247	0 020	
56	-0 282		120	0 072		184	0 271		248	0 016	
57	-0 308		121	0 122		185	0 267		249	0 041	
58	-0 373		122	0 155		186	0 203		250	0 090	
59	-0 446		123	0 191		187	0 091		251	0 136	10,0
60	-0 469		124	0 184		188	0 009		252	0 151	
61	-0 465		125	0 143		189	0 006		253	0 123	
62	-0 417		126	0 087	5,0	190	0 074		254	0 070	
63	-0 352		127	0 029		191	0 186		255	0 034	
64	-0 262		128	0 010		192	0 280		256	-0 001	

PS No.	a 10 <sup>-4</sup> m	t s	PS No.	a 10 <sup>-4</sup> m	t s	PS No.	a 10 <sup>-4</sup> m	t s	PS No.	a 10 <sup>-4</sup> m	t s
257	-0 010		321	-0 181		385	0 012		449	-- 0 031	
258	-0 031		322	-0 045		386	0 103		450	-0 102	
259	-0 061		323	0 013		387	0 164		451	-0 157	18,0
260	-0 086		324	-0 037		388	0 129		452	-0 155	
261	-0 104		325	-0 160		389	0 047		453	-0 031	
262	-0 103		326	-0 247	13,0	390	-0 055		454	-0 012	
263	-0 093		327	-0 258		391	-0 097		455	0 053	
264	-0 074		328	-0 187		392	-0 056		456	0 085	
265	-0 056		329	-0 069		393	0 043		457	0 054	
266	-0 039		330	0 044		394	0 162		458	0 002	
267	-0 000		331	0 078		395	0 220		459	-0 026	
268	0 033		332	0 061		396	0 205		460	-0 034	
269	0 067		333	-0 012		397	0 129		461	-0 014	
270	0 097		334	-0 102		398	0 053		462	0 031	
271	0 085		335	-0 127		399	0 022		463	0 061	
272	0 034		336	-0 103		400	0 052		464	0 098	
273	0 002		337	-0 045		401	0 114	16,0	465	0 123	
274	-0 050		338	0 039		402	0 175		466	0 103	
275	-0 080		339	0 094		403	0 191		467	0 078	
276	-0 096	11,0	340	0 107		404	0 172		468	0 046	
277	-0 121		341	0 058		405	0 138		469	0 042	
278	-0 116		342	-0 011		406	0 092		470	0 044	
279	-0 092		343	-0 072		407	0 052		471	0 072	
280	-0 060		344	-0 093		408	0 051		472	0 109	
281	-0 018		345	-0 068		409	0 025		473	0 133	
282	-0 011		346	-0 025		410	0 001		474	0 138	
283	-0 052		347	0 021		411	-0 026		475	0 125	
284	-0 143		348	0 008		412	-0 065		476	0 095	19,0
285	-0 241		349	-0 016		413	-0 073		477	0 105	
286	-0 330		350	-0 038		414	-0 038		478	0 129	
287	-0 343		351	-0 024	14,0	415	-0 001		479	0 181	
288	-0 298		352	0 041		416	0 029		480	0 206	
289	-0 235		353	0 135		417	0 030		481	0 200	
290	-0 203		354	0 196		418	-0 005		482	0 168	
291	-0 249		355	0 171		419	-0 045		483	0 140	
292	-0 356		356	0 053		420	-0 068		484	0 149	
293	-0 448		357	-0 111		421	-0 093		485	0 186	
294	-0 486		358	-0 205		422	-0 075		486	0 237	
295	-0 444		359	-0 348		423	-0 067		487	0 242	
296	-0 343		360	-0 336		424	-0 051		488	0 207	
297	-0 240		361	-0 258		425	-0 049		489	0 130	
298	-0 215		362	-0 155		426	-0 059	17,0	490	0 055	
299	-0 277		363	-0 059		427	-0 077		491	0 015	
300	-0 399		364	-0 056		428	-0 107		492	0 014	
301	-0 527	12,0	365	-0 123		429	-0 143		493	0 036	
302	-0 585		366	-0 187		430	-0 141		494	0 054	
303	-0 569		367	-0 218		431	-0 142		495	0 056	
304	-0 479		368	-0 136		432	-0 106		496	0 072	
305	-0 363		369	0 012		433	-0 080		497	-0 032	
306	-0 296		370	0 149		434	-0 050		498	-0 076	
307	-0 299		371	0 212		435	-0 030		499	-0 108	
308	-0 374		372	0 153		436	-0 014		500	-0 099	
309	-0 466		373	0 021		437	-0 017		501	-0 029	20,0
310	-0 528		374	-0 104		438	-0 031		502	0 051	
311	-0 520		375	-0 160		439	-0 037		503	0 138	
312	-0 432		376	-0 142	15,0	440	-0 068		504	0 199	
313	-0 320		377	-0 027		441	-0 113		505	0 213	
314	-0 244		378	0 099		442	-0 167		506	0 184	
315	-0 237		379	0 186		443	-0 203		507	0 139	
316	-0 310		380	0 174		444	-0 191		508	0 062	
317	-0 413		381	0 085		445	-0 135		509	0 027	
318	-0 462		382	-0 031		446	-0 047		510	0 030	
319	-0 456		383	-0 086		447	0 028		511	0 067	
320	-0 351		384	-0 069		448	0 032		512	0 146	

PS No.	$\sigma$ $10^{-4}$ m	$\tau$ s	PS No.	$\sigma$ $10^{-4}$ m	$\tau$ s	PS No.	$\sigma$ $10^{-4}$ m	$\tau$ s	PS No.	$\sigma$ $10^{-4}$ m	$\tau$ s
513	0 247		560	0 079		607	-0 004		654	-0 027	
514	0 314		561	0 060		608	-0 040		655	-0 025	
515	0 330		562	0 024		609	-0 037		656	0 000	
516	0 289		563	-0 013		610	-0 049		657	0 028	
517	0 224		564	-0 027		611	-0 021		658	0 045	
518	0 179		565	-0 018		612	0 011		659	0 019	
519	0 184		566	0 011		613	0 033		660	-0 032	
520	0 216		567	0 054		614	0 038		661	-0 101	
521	0 229		568	0 111		615	0 027		662	-0 162	
522	0 210		569	0 171		616	0 019		663	-0 198	
523	0 130		570	0 238		617	0 024		664	-0 193	
524	0 062		571	0 285		618	0 040		665	-0 149	
525	0 006		572	0 295		619	0 069		666	-0 036	
526	-0 004	21,0	573	0 261		620	0 082		667	-0 075	
527	0 004		574	0 201		621	0 086		668	-0 036	
528	0 018		575	0 145		622	0 068		669	-0 151	
529	0 031		576	0 142	23,0	623	0 056		670	-0 246	
530	0 020		577	0 163		624	0 036		671	-0 329	
531	0 014		578	0 222		625	0 006		672	-0 382	
532	-0 011		579	0 284		626	-0 015	25,0	673	-0 392	
533	-0 022		580	0 334		627	-0 049		674	-0 340	
534	-0 029		581	0 342		628	-0 071		675	-0 285	
535	-0 042		582	0 301		629	-0 075		676	-0 249	27,0
536	-0 066		583	0 240		630	-0 078		677	-0 245	
537	-0 120		584	0 205		631	-0 074		678	-0 298	
538	-0 188		585	0 216		632	-0 069		679	-0 348	
539	-0 241		586	0 257		633	-0 094		680	-0 366	
540	-0 252		587	0 326		634	-0 116		681	-0 330	
541	-0 243		588	0 363		635	-0 150		682	-0 247	
542	-0 212		589	0 380		636	-0 178		683	-0 175	
543	-0 183		590	0 358		637	-0 188		684	-0 135	
544	-0 170		591	0 303		638	-0 198		685	-0 149	
545	-0 189		592	0 273		639	-0 194		686	-0 165	
546	-0 233		593	0 341		640	-0 187		687	-0 178	
547	-0 286		594	0 249		641	-0 170		688	-0 142	
548	-0 311		595	0 252		642	-0 161		689	-0 097	
549	-0 280		596	0 245		643	-0 154		690	-0 067	
550	-0 215		597	0 244		644	-0 140		691	-0 051	
551	-0 128	22,0	598	0 225		645	-0 115		692	-0 071	
552	-0 038		599	0 212		646	-0 055		693	-0 101	
553	-0 018		600	0 180		647	0 001		694	-0 110	
554	-0 024		601	0 160	24,0	648	0 049		695	-0 091	
555	-0 052		602	0 130		649	0 035		696	-0 043	
556	-0 055		603	0 118		650	0 094		697	0 020	
557	-0 033		604	0 104		651	0 071	26,0	698	0 061	
558	0 013		605	0 081		652	0 039		699	0 064	
559	0 061		606	0 040		653	-0 001		700	0 036	

ANNEX II

Set-value signals for the test stand inspection of driver's seats for Class II standard tractors (point 2.5.3.2.1.).

PS = set point

a = amplitude of the required value signal in  $10^{-4}m$

t = measurement time in seconds

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These signals are shown in the table for 700 set points.

They can be stored numerically and, after passing through a low-pass filter with a cut-off frequency of about 10 Hz and high-frequency attenuation of 12 dB/octave, they show the amplitude of the set value for the electro-hydraulically controlled test stand. The set-value signals must be repeated without interruption.

PS No.	$a$ $10^{-4}$ m	$t$ s	PS No.	$a$ $10^{-4}$ m	$t$ s	PS No.	$a$ $10^{-4}$ m	$t$ s	PS No.	$a$ $10^{-4}$ m	$t$ s
1	0 156	0	65	0 044		129	-0 260		193	0 332	
2	0 147	0,04	66	0 025		130	-0 247		194	0 225	
3	0 144	0,08	67	-0 026		131	-0 228		195	0 099	
4	0 162		68	-0 077		132	-0 204		196	0 014	
5	0 210		69	-0 115		133	-0 192		197	-0 012	
6	0 272		70	-0 131		134	-0 179		198	0 033	
7	0 336		71	-0 102		135	-0 144		199	0 131	
8	0 382		72	-0 031		136	-0 128		200	0 247	
9	0 404		73	0 035		137	-0 117		201	0 335	8,0
10	0 408		74	0 078		138	-0 131		202	0 348	
11	0 376		75	0 057		139	-0 154		203	0 314	
12	0 324		76	0 000	3,0	140	-0 164		204	0 239	
13	0 275		77	-0 069		141	-0 160		205	0 161	
14	0 226		78	-0 124		142	-0 128		206	0 124	
15	0 176		79	-0 143		143	-0 059		207	0 139	
16	0 141		80	-0 129		144	0 015		208	0 218	
17	0 126		81	-0 091		145	0 074		209	0 328	
18	0 144		82	-0 045		146	0 084		210	0 405	
19	0 180		83	-0 094		147	0 042		211	0 426	
20	0 205		84	-0 004		148	-0 034		212	0 403	
21	0 198		85	-0 016		149	-0 101		213	0 314	
22	0 184		86	-0 047		150	-0 147		214	0 191	
23	0 138		87	-0 080		151	-0 141	6,0	215	0 088	
24	0 102		88	-0 083		152	-0 091		216	0 025	
25	0 068		89	-0 080		153	-0 031		217	0 030	
26	0 050	1,0	90	-0 060		154	0 017		218	0 087	
27	0 055		91	-0 029		155	0 027		219	0 173	
28	0 078		92	-0 013		156	-0 012		220	0 240	
29	0 120		93	-0 004		157	-0 058		221	0 274	
30	0 184		94	-0 039		158	-0 127		222	0 250	
31	0 209		95	-0 100		159	-0 151		223	0 182	
32	0 224		96	-0 171		160	-0 125		224	0 077	
33	0 206		97	-0 218		161	-0 049		225	-0 019	
34	0 157		98	-0 226		162	0 045		226	-0 075	9,0
35	0 101		99	-0 190		163	0 104		227	-0 061	
36	0 049		100	-0 116		164	0 122		228	-0 033	
37	-0 002		101	-0 054	4,0	165	0 104		229	0 011	
38	-0 038		102	-0 001		166	0 046		230	0 042	
39	-0 068		103	-0 001		167	-0 018		231	0 025	
40	-0 088		104	-0 045		168	-0 047		232	-0 021	
41	-0 100		105	-0 126		169	-0 036		233	-0 078	
42	-0 110		106	-0 191		170	0 016		234	-0 142	
43	-0 151		107	-0 223		171	0 145		235	-0 197	
44	-0 183		108	-0 206		172	0 257		236	-0 225	
45	-0 234		109	-0 168		173	0 330		237	-0 217	
46	-0 303		110	-0 122		174	0 330		238	-0 196	
47	-0 364		111	-0 095		175	0 258		239	-0 133	
48	-0 410		112	-0 101		176	0 138	7,0	240	-0 038	
49	-0 407		113	-0 114		177	0 034		241	0 052	
50	-0 367		114	-0 161		178	-0 037		242	0 128	
51	-0 289	2,0	115	-0 212		179	-0 030		243	0 168	
52	-0 180		116	-0 254		180	0 026		244	0 164	
53	-0 081		117	-0 273		181	0 141		245	0 169	
54	-0 000		118	-0 258		182	0 216		246	0 170	
55	-0 011		119	-0 211		183	0 243		247	0 188	
56	-0 070		120	-0 169		184	0 188		248	0 210	
57	-0 168		121	-0 125		185	0 079		249	0 220	
58	-0 256		122	-0 115		186	-0 015		250	0 210	
59	-0 307		123	-0 127		187	-0 047		251	0 185	10,0
60	-0 302		124	-0 156		188	-0 008		252	0 149	
61	-0 249		125	-0 195		189	0 091		253	0 100	
62	-0 157		126	-0 232	5,0	190	0 230		254	0 057	
63	-0 056		127	-0 256		191	0 340		255	0 035	
64	0 013		128	-0 260		192	0 381		256	0 006	

PS No.	a 10 <sup>-4</sup> m	r s	PS No.	a 10 <sup>-4</sup> m	r s	PS No.	a 10 <sup>-4</sup> m	r s	PS No.	a 10 <sup>-4</sup> m	r s
257	-0 000		321	-0 029		385	0 000		449	-0 008	
258	0 010		322	-0 075		386	-0 001		450	-0 050	
259	0 034		323	-0 138		387	-0 010		451	-0 000	18,0
260	0 047		324	-0 189		388	-0 023		452	0 053	
261	0 047		325	-0 193		389	-0 019		453	0 129	
262	0 031		326	-0 153	13,0	390	0 014		454	0 155	
263	0 028		327	-0 095		391	0 060		455	0 156	
264	0 036		328	-0 012		392	0 093		456	0 111	
265	0 072		329	0 033		393	0 117		457	0 069	
266	0 125		330	0 059		394	0 137		458	0 049	
267	0 188		331	0 064		395	0 123		459	0 036	
268	0 216		332	0 000		396	0 032		460	0 056	
269	0 189		333	-0 074		397	0 075		461	0 100	
270	0 119		334	-0 147		398	0 055		462	0 143	
271	0 031		335	-0 164		399	0 062		463	0 178	
272	-0 026		336	-0 142		400	0 087		464	0 193	
273	-0 059		337	-0 067		401	0 113	16,0	465	0 178	
274	-0 052		338	-0 001		402	0 126		466	0 136	
275	-0 009		339	0 057		403	0 139		467	0 087	
276	0 039	11,0	340	0 020		404	0 119		468	0 050	
277	0 081		341	0 040		405	0 080		469	0 041	
278	0 107		342	-0 010		406	0 023		470	0 057	
279	0 079		343	-0 096		407	-0 043		471	0 117	
280	0 023		344	-0 148		408	-0 099		472	0 165	
281	-0 044		345	-0 164		409	-0 121		473	0 188	
282	-0 121		346	-0 134		410	-0 090		474	0 178	
283	-0 168		347	-0 060		411	-0 009		475	0 171	
284	-0 172		348	0 038		412	0 072		476	0 154	19,0
285	-0 147		349	0 136		413	0 120		477	0 141	
286	-0 119		350	0 195		414	0 111		478	0 137	
287	-0 114		351	0 170	14,0	415	0 049		479	0 146	
288	-0 155		352	0 077		416	-0 021		480	0 177	
289	-0 217		353	-0 067		417	-0 098		481	0 231	
290	-0 287		354	-0 212		418	-0 136		482	0 282	
291	-0 243		355	-0 321		419	-0 117		483	0 314	
292	-0 341		356	-0 350		420	-0 072		484	0 287	
293	-0 289		357	-0 339		421	-0 020		485	0 222	
294	-0 217		358	-0 277		422	0 038		486	0 138	
295	-0 157		359	-0 189		423	0 061		487	0 050	
296	-0 150		360	-0 119		424	0 026		488	-0 003	
297	-0 193		361	-0 100		425	-0 016		489	0 001	
298	-0 248		362	-0 124		426	-0 090	17,0	490	0 041	
299	-0 319		363	-0 170		427	-0 151		491	0 095	
300	-0 371		364	-0 193		428	-0 171		492	0 124	
301	-0 378	12,0	365	-0 173		429	-0 150		493	0 112	
302	-0 354		366	-0 105		430	-0 050		494	0 060	
303	-0 309		367	-0 000		431	-0 001		495	-0 022	
304	-0 264		368	0 075		432	0 064		496	-0 112	
305	-0 241		369	0 092		433	0 113		497	-0 161	
306	-0 236		370	0 074		434	0 109		498	-0 153	
307	-0 264		371	0 011		435	0 089		499	-0 087	
308	-0 262		372	-0 049		436	0 016		500	0 030	
309	-0 282		373	-0 082		437	-0 040		501	0 127	20,0
310	-0 275		374	-0 076		438	-0 098		502	0 197	
311	-0 278		375	-0 039		439	-0 142		503	0 203	
312	-0 285		376	0 010	15,0	440	-0 147		504	0 147	
313	-0 302		377	0 053		441	-0 112		505	0 060	
314	-0 318		378	0 078		442	-0 028		506	-0 027	
315	-0 316		379	0 068		443	0 058		507	-0 103	
316	-0 293		380	0 033		444	0 118		508	-0 096	
317	-0 238		381	0 004		445	0 124		509	-0 026	
318	-0 154		382	-0 000		446	0 000		510	0 062	
319	-0 070		383	-0 013		447	0 006		511	0 198	
320	-0 021		384	-0 003		448	-0 052		512	0 275	

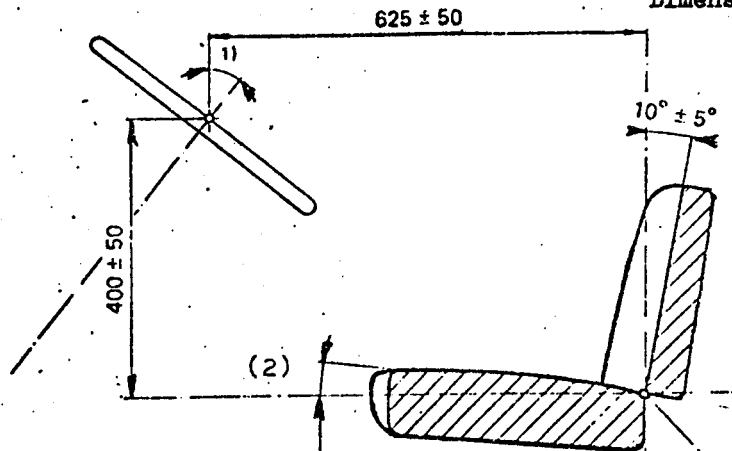


PS No.	a 10 <sup>-4</sup> m	t s	PS No.	a 10 <sup>-4</sup> m	t s	PS No.	a 10 <sup>-4</sup> m	t s	PS No.	a 10 <sup>-4</sup> m	t s
513	0 293		560	-0 065		607	-0 061		654	-0 110	
514	0 244		561	-0 117		608	-0 057		655	-0 039	
515	0 149		562	-0 164		609	-0 044		656	0 008	
516	0 056		563	-0 191		610	-0 040		657	0 019	
517	0 005		564	-0 165		611	-0 037		658	-0 033	
518	-0 001		565	-0 109		612	-0 028		659	-0 102	
519	0 023		566	-0 025		613	-0 017		660	-0 194	
520	0 035		567	0 081		614	-0 006		661	-0 264	
521	0 063		568	0 163		615	0 011		662	-0 292	
522	0 034		569	0 191		616	0 032		663	-0 261	
523	-0 009		570	0 164		617	0 045		664	-0 210	
524	-0 074		571	0 089		618	0 050		665	-0 147	
525	-0 154	21,0	572	-0 004		619	0 039		666	-0 092	
526	-0 203		573	-0 075		620	0 036		667	-0 029	
527	-0 204		574	-0 029		621	0 027		668	-0 133	
528	-0 167		575	-0 054		622	0 025		669	-0 248	
529	-0 119		576	0 024	23,0	623	0 005		670	-0 360	
530	-0 077		577	0 126		624	0 000		671	-0 455	
531	-0 068		578	0 203		625	-0 012		672	-0 497	
532	-0 094		579	0 223		626	-0 040	25,0	673	-0 473	
533	-0 168		580	0 200		627	-0 047		674	-0 393	
534	-0 254		581	0 113		628	-0 058		675	-0 294	
535	-0 337		582	0 026		629	-0 070		676	-0 230	27,0
536	-0 383		583	-0 003		630	-0 076		677	-0 214	
537	-0 400		584	-0 003		631	-0 098		678	-0 241	
538	-0 391		585	0 057		632	-0 103		679	-0 294	
539	-0 365		586	0 149		633	-0 127		680	-0 343	
540	-0 346		587	0 236		634	-0 158		681	-0 375	
541	-0 342		588	0 290		635	-0 158		682	-0 379	
542	-0 372		589	0 299		636	-0 163		683	-0 349	
543	-0 398		590	0 244		637	-0 182		684	-0 276	
544	-0 431		591	0 192		638	-0 177		685	-0 202	
545	-0 464		592	0 145		639	-0 184		686	-0 136	
546	-0 459		593	0 095		640	-0 201		687	-0 099	
547	-0 425		594	0 090		641	-0 199		688	-0 101	
548	-0 354		595	0 111		642	-0 187		689	-0 139	
549	-0 259		596	0 151		643	-0 145		690	-0 196	
550	-0 187		597	0 186		644	-0 092		691	-0 246	
551	-0 174	22,0	598	0 185		645	-0 040		692	-0 256	
552	-0 182		599	0 165		646	0 017		693	-0 234	
553	-0 211		600	0 120		647	0 044		694	-0 156	
554	-0 241		601	0 057	24,0	648	0 061		695	-0 078	
555	-0 228		602	0 008		649	0 029		696	0 015	
556	-0 192		603	-0 022		650	-0 018		697	0 083	
557	-0 131		604	-0 044		651	-0 078	26,0	698	0 118	
558	-0 066		605	-0 062		652	-0 129		699	0 080	
559	-0 050		606	-0 070		653	-0 135		700	0 000	

TEST STAND  
(point 2.5.3.2.)

Dimension in mm

Profile



A	B
± 20	± 20
265	900
285	900
305	900
325	880
345	860
365	840
385	820
405	800
425	780
445	760
465	740
485	720

+ 30  
min  
adjustment

Seat reference point (SRP)

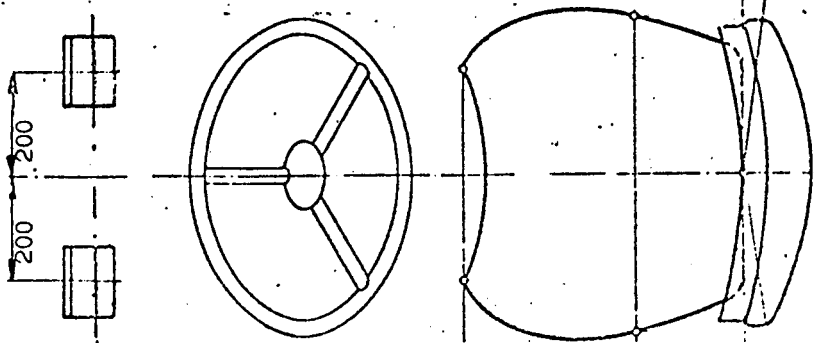
+ 75 min.  
adjustment

Pivot point

$R \geq 2.000$

B

Plan

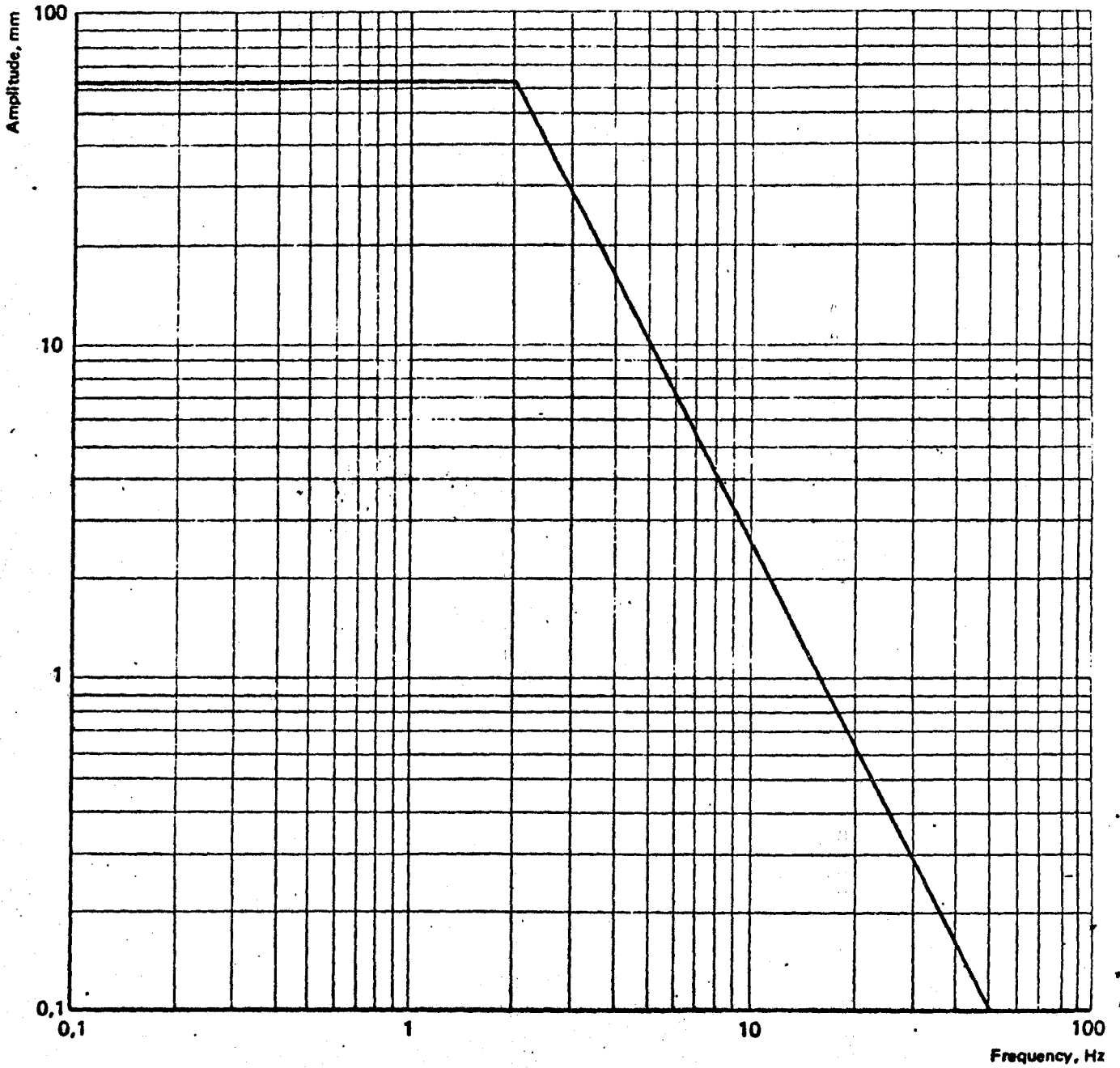


Seat reference point (SRP)

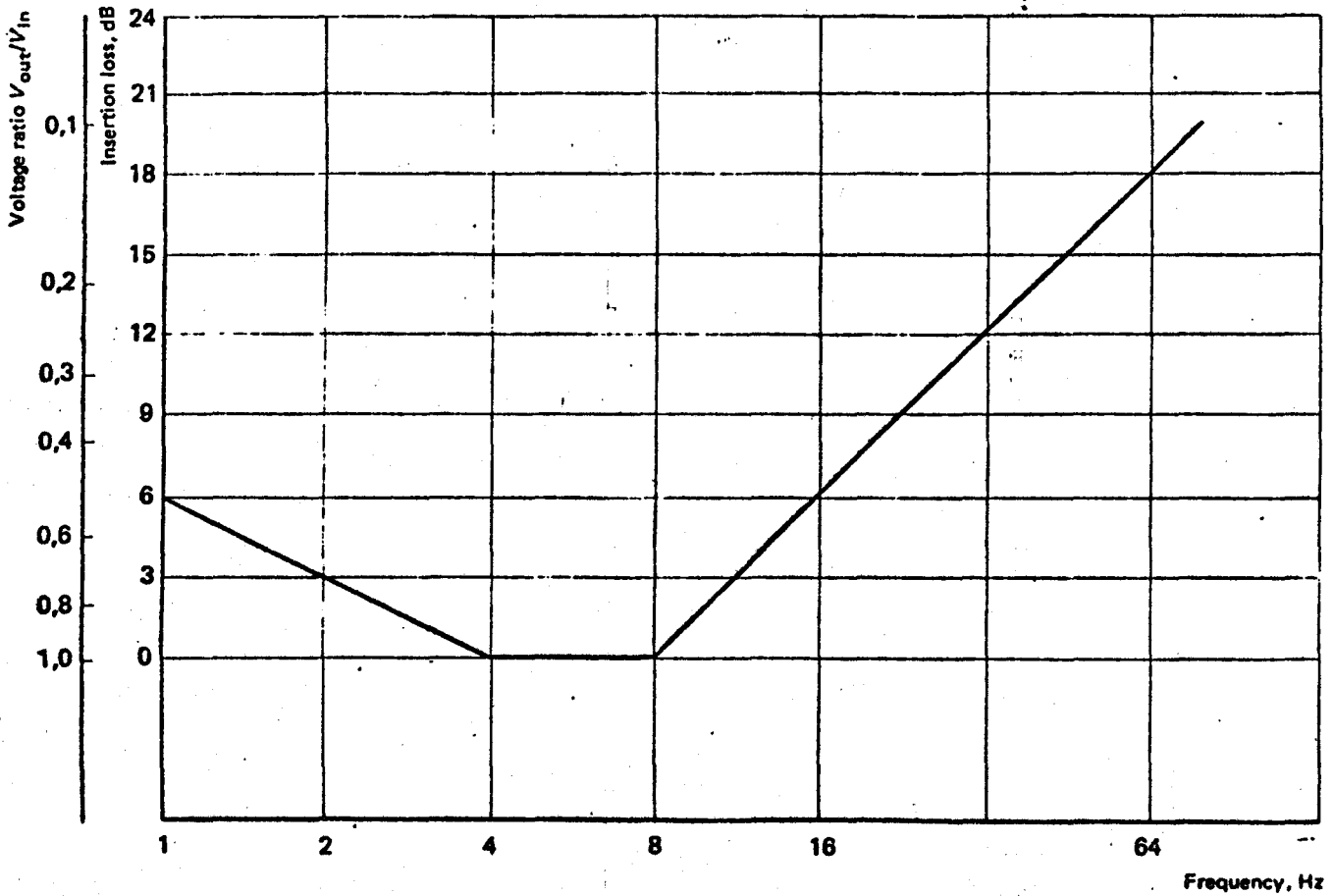
- 1) The angle of the steering column in relation to the vertical depends on the position of the seat, the diameter of the steering wheel.
- 2) The rearward inclination of the surface of the fitted seat cushion must be 3°-12° in relation to the horizontal when measured with the loading device in accordance with Appendix 1. The choice of the angle of inclination within this class depends of the position when seated.

TRAVEL OF THE VIBRATION TEST STAND

(point 2.5.3.2.)



CHARACTERISTIC OF THE FILTER OF THE VIBRATION MEASURING  
INSTRUMENT (Point 2.5.3.3.5.)



Spectral power density of the vertical vibration acceleration at the seat attachment of the Class I reference tractor (point 2.5.5.)

-----

The spectral power density of the vertical vibration acceleration at the seat attachment of the Class I reference tractor can be approximately expressed by the following relation :

$$\phi = \phi_{\max} \exp - \frac{(f - f_m)^2}{2b^2}$$

where the constants have the values :

$$\phi_{\max} = 6.0 \text{ (m/s}^2\text{)}^2/\text{Hz}$$

$$f_m = 3.25 \text{ Hz}$$

$$b = 0.33 \text{ Hz}$$

The permitted tolerances are :

$$\phi_{\max} = \pm 10 \%$$

$$f_m = \pm 5 \%$$

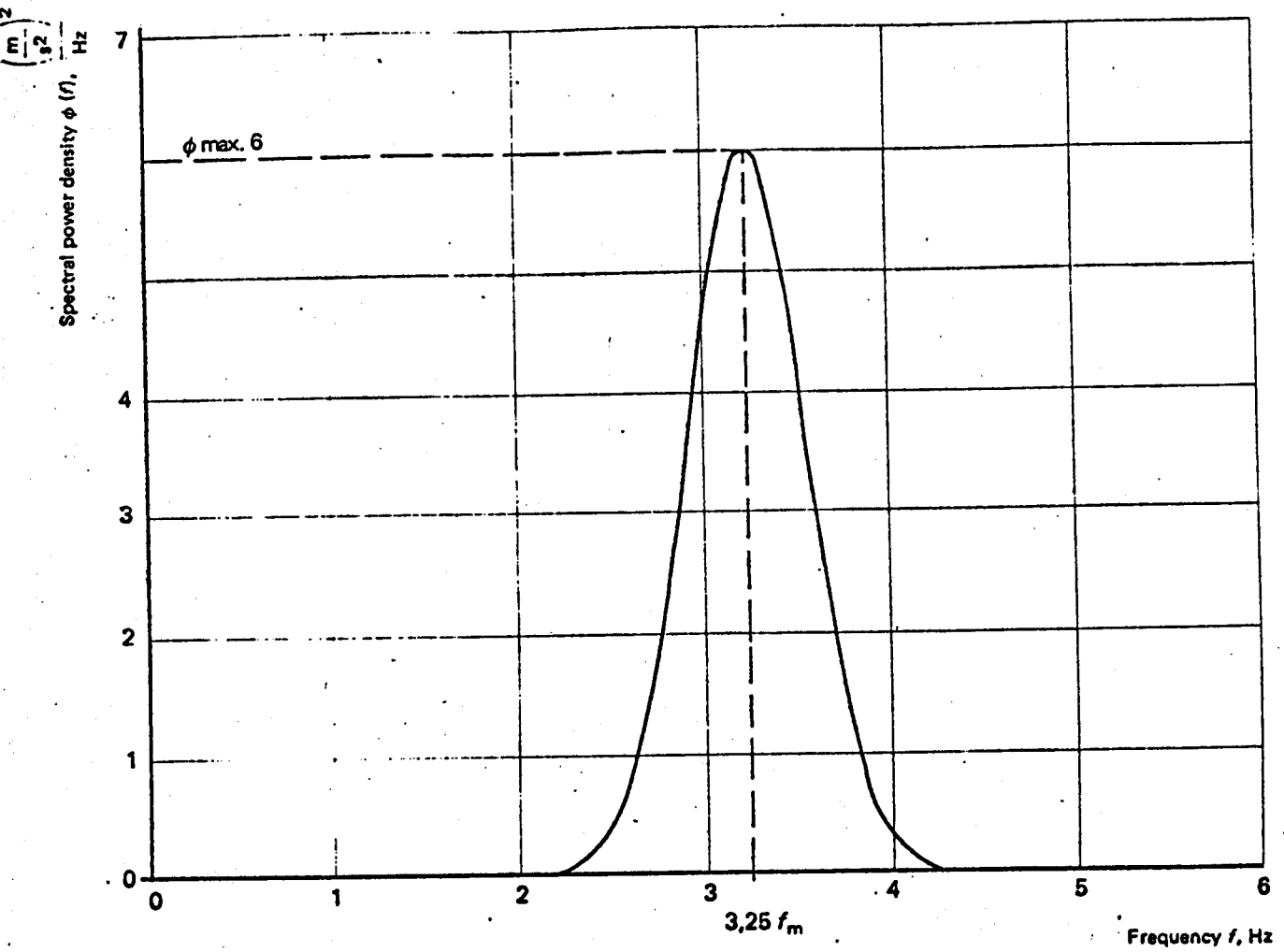
The tolerance with respect to  $b$  is determined by the fact that, in accordance with point 2.5.5.2., the weighted vibration acceleration at the seat attachment must be within the limits :

$$a_w = 1.9 \dots 2.2 \text{ m/s}^2$$



SPECTRAL POWER DENSITY  $\phi(f)$

Approximate function for the spectral power density of the vertical vibration acceleration at the seat attachment of the reference tractor for class 1.



Spectral power density of the vertical vibration acceleration at the seat attachment of the Class II reference tractor (point 2.5.5.)

-----

The spectral power density of the vertical vibration acceleration at the seat attachment of the Class II reference tractor can be approximately described by the following relation :

$$\phi = \phi_{\max} \exp - \frac{(f - f_m)^2}{2b^2}$$

where the constants have the values :

$$\phi_{\max} = 5.5 \text{ (m/s}^2\text{)}^2/\text{Hz}$$

$$f_m = 2.65 \text{ Hz}$$

$$b = 0.3 \text{ Hz}$$

The permitted tolerances are :

$$\phi_{\max} = \pm 10 \%$$

$$f_m = \pm 5 \%$$

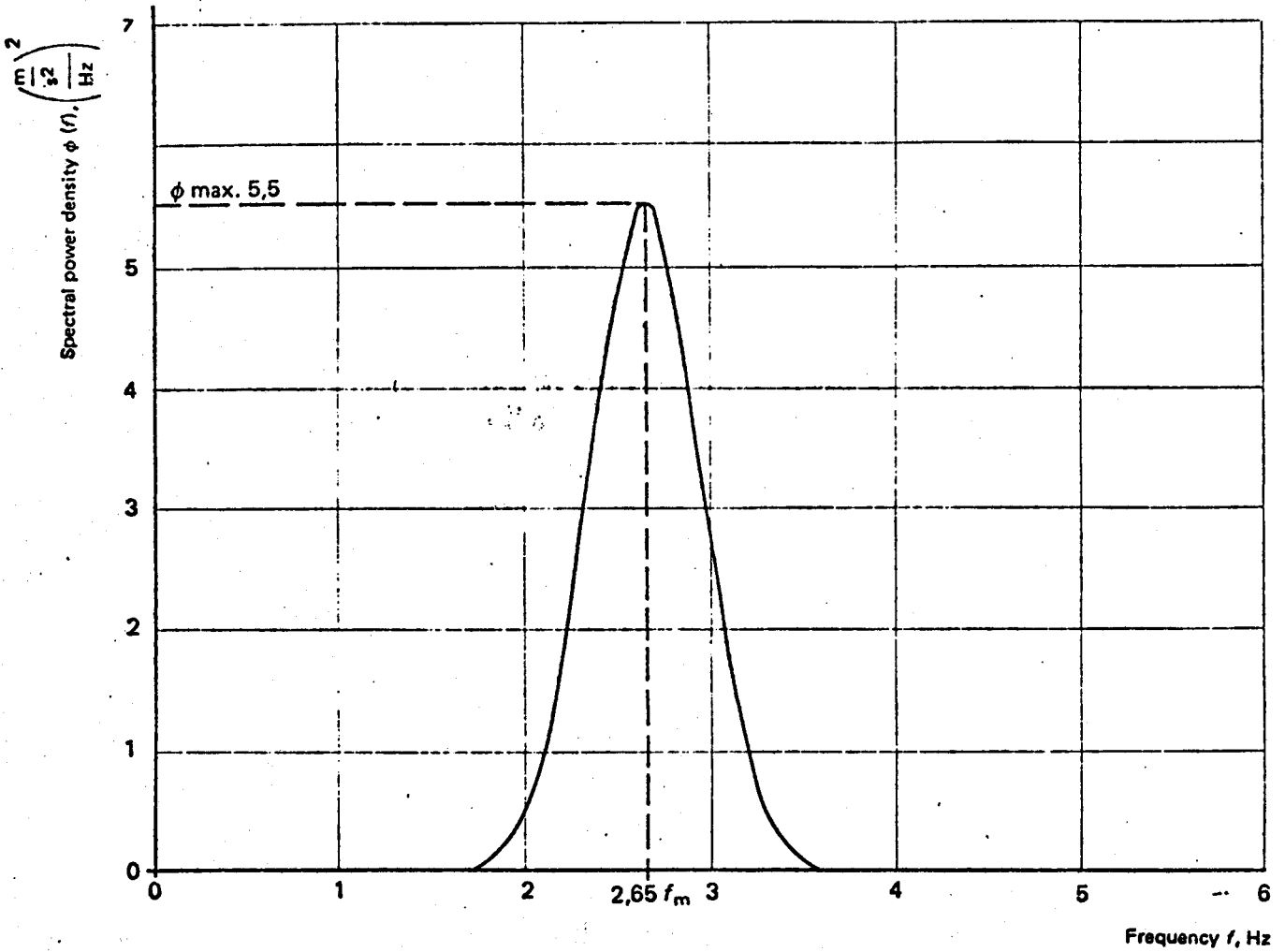
The tolerance with respect to b is determined by the fact that, in accordance with point 2.5.5.2., the weighted vibration acceleration at the seat attachment must be within the limits :

$$a_w = 1.6 \dots 1.8 \text{ m/s}^2$$



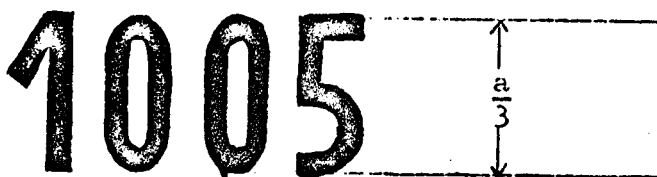
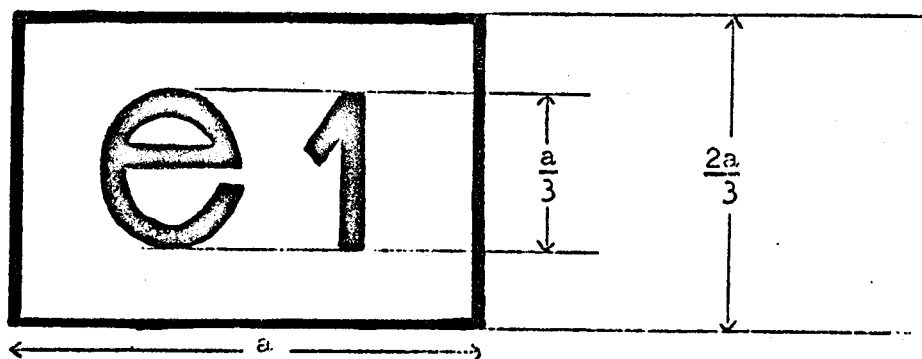
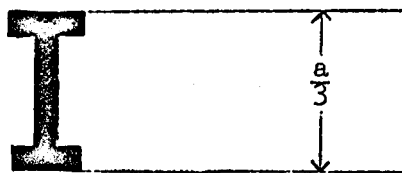
SPECTRAL POWER DENSITY  $\phi$  (f)

Approximate function for the spectral power density of the vertical vibration acceleration at the seat attachment of the reference tractor for class 2.



EXAMPLE OF AN EEC TYPE-APPROVAL MARK  
( see point 3.5.)

$a \geq 15 \text{ mm}$



The seat bearing the EEC type-approval mark above is a seat approved in Germany under number 1005.

ANNEX III

MODEL FOR AN EEC COMPONENT TYPE-APPROVAL CERTIFICATE

Name of the  
competent authority

Notification concerning the grant, refusal, withdrawal or extension of EEC component type-approval for a type of driver's seat for a wheeled agricultural or forestry tractor.

EEC component type-approval No .....

- 1. Trademark of seat .....
- 2. Name and address of seat manufacturer .....
- 3. If applicable, name and address of manufacturer's authorized representative .....
- 4. Mark, type and trade name of tractor(s) for which seat is intended (\*) .....
- 5. Submitted for EEC component type-approval on .....
- 6. Test laboratory .....
- 7. Date and number of laboratory report .....
- 8. Date on which EEC type-approval was granted/refused/withdrawn (\*\*) .....
- 9. Place .....
- 10. Date .....
- 11. A note describing the seat, particularly the amplitude of adjustment, the total weight, the suspension system characteristics, type and thickness of upholstery and directions for attachment, is attached to this certificate. Designs of the sides of the seat in DIN A4 form with a lateral and frontal view are enclosed this note.
- 12. Remarks .....
- 13. Signature .....

(\*) Where appropriate, state the class(es) of the tractor(s) for which seat is intended.

(\*\*) Delete whichever is inapplicable.

SEAT INSTALLATION REQUIREMENTS FOR EEC TYPE-APPROVAL OF A TRACTOR

1. Every driver's seat must bear the EEC type-approval mark and comply with the following installation requirements :
  - 1.1. The driver's seat must be installed in such a way that :
    - 1.1.1. the driver is assured of a comfortable position for driving and manoeuvring the tractor;
    - 1.1.2. the seat is easily accessible;
    - 1.1.3. the driver, when seated in the normal driving position, can easily reach the various controls of the tractor that are likely to be actuated during operation;
    - 1.1.4. no part of any of the seat or tractor components is likely to cause the driver to suffer cuts or bruises.
2. The holder of the EEC type-approval may request that it be extended to other types of seat. The competent authorities shall grant this extension on the following conditions :
  - 2.1. the new type of seat has received EEC type-approval;
  - 2.2. it has been designed to be installed on the type of tractor for which the extension of the EEC type-approval has been requested;
  - 2.3. it is installed in such a manner as to comply with the installation requirements in this Annex.
3. Seats intended for tractors with a minimum distance of 1 150 mm between the rear wheels may have the following minimum dimensions with respect to the depth and width of the seat surface :

depth of seat surface	:	300 mm
width of seat surface	:	400 mm

This provision is applicable only if the values specified for the depth and the width of the seat surface - i.e., minimum of  $400 \pm 50$  mm and 450 mm respectively - cannot be observed for valid technical reasons.

4. A certificate conforming to the model shown in Annex V shall be attached to the EEC type-approval certificate for each type-approval or extension of type-approval granted or refused.

ANNEX V

ANNEX TO THE EEC TYPE-APPROVAL CERTIFICATE FOR A TRACTOR : THE DRIVER'S SEAT

(Article 4(2) and Article 10 of Council Directive No 74/150/EEC of 4.3.1974 on the approximation of the laws of the Member States relating to the type-approval of wheeled agricultural or forestry tractors)

Name of the  
competent authority

- EEC Type-approval No .....  
..... extension (\*)
- 1. Trademark of tractor .....
- 2. Type of tractor .....
- 3. Name and address of tractor manufacturer .....
- 4. If applicable, name and address of authorized representative .....
- 5. Trademark of driver's seat and component type-approval number .....
- 6. Extension of EEC type-approval of the tractor to the following seat type .....
- 7. Tractor submitted for EEC type-approval on .....
- 8. Technical department responsible for verifying conformity for the purpose of EEC type-approval .....
- 9. Date of report issued by that department .....
- 10. Number of report issued by that department .....
- 11. EEC type-approval with respect to the driver's seat has been granted/refused (\*\*)
- 12. An extension of EEC type-approval with respect to the driver's seat has been granted/refused (\*\*)
- 13. Place .....
- 14. Date .....
- 15. Signature .....

---

(\*) Where appropriate, state whether the extension of the initial EEC type-approval is the first, second, etc.  
(\*\*) Delete whichever is inapplicable.