International Standard 7424

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Agricultural equipment — Matching of wheeled tractors and rear mounted implements — Code numbering system

Matériel agricole — Assortiment des tracteurs à roues et des instruments portés à l'arrière — Système de numéros code

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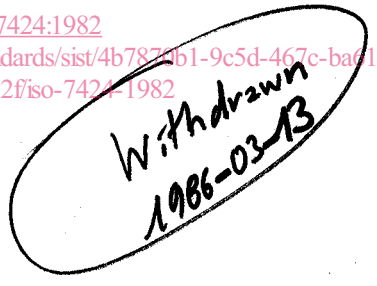

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 7424 was developed by Technical Commitee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, and was circulated to the member bodies in March 1981.

It has been approved by the member bodies of the following countries:

Austria	Iraq	South Africa, Rep. of
Belgium	Italy	Spain
Canada	Korea, Dèm. P. Rep. of	Sweden
China	Korea, Rep. of	Switzerland
Czechoslovakia	Mexico	Turkey
Egypt, Arab Rep. of	New Zealand	United Kingdom
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The member bodies of the following countries expressed disapproval of the document on technical grounds:

Brazil
Finland
Germany, F.R.

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Agricultural equipment — Matching of wheeled tractors and rear mounted implements — Code numbering system

1 Scope and field of application

This International Standard specifies a system for matching agricultural wheeled tractors, having two or more axles, with fully supported, rear mounted implements, by ensuring that a selected load remains on the front axle of a tractor when carrying a particular implement.

2 Symbols (see also the figure)

W_{re} = The selected static load, in kilograms, remaining on the front axle of the tractor.

F_{re} = The force, in kilonewtons, exerted by the load W_{re}.

W_{tr} = The maximum load, in kilograms, which may be transferred from the front axle of the tractor.

F_{tr} = The maximum force, in kilonewtons, which may be transferred from the front axle of the tractor.

l = The tractor wheel base, in metres.

G = The force, in kilonewtons, exerted by the implement, including accessories, in the laden condition.

y = The horizontal distance, in metres, between the lower hitch points and the centre of gravity of the implement with the lower links horizontal.

x = The horizontal distance, in metres, between the centreline of the tractor rear wheels and the lower hitch points, with the lower links horizontal.

M_I = The moment of the implement, in kilonewton metres.

M_T = The moment of the tractor, in kilonewton metres.

C_I = The implement code number.

C_T = The tractor code number.

f = A correction factor.

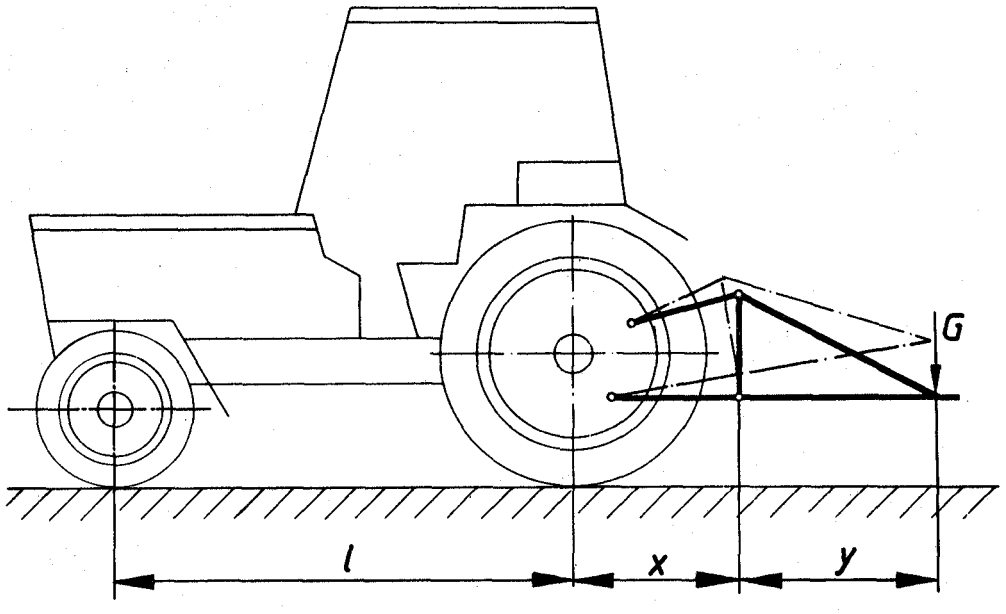

Figure — Symbols used in calculating code numbers

3 Code numbers

The system for matching tractors with implements is based on :

a) a code number attributed to the implement, derived from the moment of the force exerted by the mounted implement about the rear axle of the tractor;

b) a code number attributed to the tractor, derived from the moment, about the rear axle, of the load which may safely be transferred from the front axle to the rear axle.

3.1 Implement code numbers

For each implement, the code numbers corresponding to the implement fitted with different accessories shall be determined in accordance with 4.1 and presented by the implement manufacturer as shown in annex A with a reference to this International Standard.

3.2 Tractor code numbers

For each tractor, the code numbers corresponding to the tractor fitted with different front ballast weights shall be determined in accordance with 4.2 and presented by the tractor manufacturer as shown in annex A with a reference to this International Standard.

4 Determination of code numbers
(see also annex B)

4.1 Implement code number

The implement code number shall be derived from the formula

$$M_I = G\,(y + x)$$

In general

$$M_I = G\,(y + 1)$$

The implement code number C_I is the numerical value of M_I rounded to one decimal place.

$$C_I \triangleq M_I$$

NOTE — When calculating the implement code number, a nominal value of $x = 1$ is used. Variations in x are taken into account by the correction factor which is incorporated in the calculation of the tractor code number.

4.2 Tractor code number

The tractor code number is derived from the formula

$$M_T = F_{tr}\,lf$$

The tractor code number C_T is the numerical value of M_T rounded to one decimal place.

$$C_T \triangleq M_T$$

The correction factor f has the values given in the table.

Table — Correction factor, f

x									
>		0,83	0,88	0,94	1,0	1,05	1,1	1,15	1,2
⩽	0,83	0,88	0,94	1,0	1,05	1,1	1,15	1,2	1,3
f	1,09	1,06	1,03	1,0	0,96	0,94	0,91	0,88	0,83

NOTE — The value of x will vary for different tractors. In determining the implement code number, a nominal value of 1 m is assumed and any variations are taken into account in determining the tractor code number :

$$f = \frac{(1 + y)}{(x + y)}$$

If an implement coupler is used, the value of x should be increased accordingly.

5 Application of the code

Provided that the implement code C_I is equal to or less than the tractor code C_T, the remaining static front axle load will not be less than the value of W_{re} resulting from the selection of W_{tr} for the calculation.

Annex A

Examples of presentation of code numbers in users' handbooks

A.1 Implement code numbers

Reference No.	Assembly	Code No.
(1)	Basic implement	13
(2)	Reference (1) + 5 disc coulters	14,5
(3)	Reference (1) + 5 spring trip beams	15
(4)	Reference (2) + 5 spring trip beams	16,7

A.2 Tractor code numbers

Reference No.	Assembly	Code No.	
		Without quick coupler	With quick coupler
(1)	Basic tractor	12	10,5
(2)	Reference (1) + 2 front wheel weights	14	12,3
(3)	Reference (1) + 4 front wheel weights	16	14,0
(4)	Reference (3) + front chassis weight unit	20	17,5

Annex B

Examples of the determination of code numbers

B.1 Implement code number (see 4.1)

Assume that the mass of the implement = 780 kg,

then

$$G = \frac{780 \times 9{,}81}{1\,000} = 7{,}65 \text{ kN}$$

and

$y = 0{,}9$ m

$x = 1$ m

Therefore

$$M_{\text{I}} = G\,(y + x) = 7{,}65\,(0{,}9 + 1) = 14{,}535 \text{ kN·m}$$

and hence

$C_{\text{I}} = 14{,}5$

B.2 Tractor code number (see 4.2)

B.2.1 Tractor without front ballast and without implement coupler

Assume that the mass to be transferred from the tractor front axle for the purpose of calculating the code = 600 kg,

then

$$F_{\text{tr}} = \frac{600 \times 9{,}81}{1\,000} = 5{,}89 \text{ kN}$$

and

$l = 2{,}2$ m

$x = 0{,}94$ m

$f = 1{,}03$

Therefore

$$M_{\text{T}} = F_{\text{tr}}\,lf = 5{,}89 \times 2{,}2 \times 1{,}03 = 13{,}347 \text{ kN·m}$$

and hence

$C_{\text{T}} = 13{,}3$

B.2.2 Tractor without front ballast and with implement coupler

Assume that the mass to be transferred from the tractor front axle for the purpose of calculating the code = 600 kg,

then

$$F_{\text{tr}} = \frac{600 \times 9{,}81}{1\,000} = 5{,}89 \text{ kN}$$

and

l = 2,2 m

x = 1,04 m

f = 0,96

Therefore

$$M_T = F_{tr} l f = 5,89 \times 2,2 \times 0,96 = 12,440 \text{ kN·m}$$

and hence

C_T = 12,4

B.2.3 Tractor with front ballast and without implement coupler

Assume that the mass to be transferred from the tractor front axle for the purpose of calculating the code = 900 kg,

then

$$F_{tr} = \frac{900 \times 9,81}{1\,000} = 8,83 \text{ kN}$$

and

l = 2,2 m

x = 0,94 m

f = 1,03

Therefore

$$M_T = F_{tr} l f = 8,83 \times 2,2 \times 1,03 = 20,009 \text{ kN·m}$$

and hence

C_T = 20,0