

# International Standard



# 7095

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## Earth-moving machinery — Crawler tractors and crawler loaders — Operator's controls

*Engins de terrassement — Tracteurs à chenilles et chargeuses à chenilles — Commandes du conducteur*

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Price based on 2 pages

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

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 7095 was developed by Technical Committee ISO/TC 127, *Earth moving machinery*.

This second edition was submitted directly to the ISO Council, in accordance with clause 5.10.1 of part 1 of the Directives for the technical work of ISO. It cancels and replaces the first edition (i.e. ISO 7095-1981), which had been approved by the member bodies of the following countries:

Australia	Finland	South Africa, Rep. of
Austria	France	Sweden
Belgium	Germany, F. R.	United Kingdom
Brazil	India	USA
Bulgaria	Italy	USSR
Chile	Japan	
Egypt, Arab Rep. of	Romania	

The member bodies of the following countries had expressed disapproval of the document on technical grounds :

Czechoslovakia  
Poland

# Earth-moving machinery — Crawler tractors and crawler loaders — Operator's controls

## 1 Scope

This International Standard specifies the requirements, movement directions and actuating forces for the operator's controls on crawler tractors and crawler loaders as they relate to the operator and his position on the machine.

## 2 Field of application

This International Standard applies to crawler tractors and crawler loaders as defined in ISO 6165 and is intended as a guide when designing operator controls on these machines.

The range of sizes of operators considered in this International Standard is that established in ISO 3411.

## 3 References

ISO 3411, *Earth-moving machinery — Human physical dimensions of operators and minimum operator space envelope.*

ISO 6165, *Earth-moving machinery — Basic types — Vocabulary.*

ISO 6682, *Earth-moving machinery — Zones of comfort and reach for controls.*

## 4 Controls

### 4.1 General requirements

The minimum normal operating space envelope around the operator for operator enclosures (cabs, ROPS, FOPS) and the clearance between the operator enclosure and controls are defined in ISO 3411.

4.2 The operator's controls shall be located as specified in 5.1 which takes seat adjustment into account.

## 5 Location of controls

5.1 The controls listed in table 1 shall be located with their neutral position and, if possible, all other positions in the zones of comfort. All other positions that they may occupy shall be at least within the zone of reach. See ISO 6682.

Table 1 — Controls

Controls
Steering
Accelerator (speed)
Decelerator
Service brake
Transmission
Tool movement
Clutch (flywheel)

All controls frequently used and not specified above shall be located so that all positions they may occupy are within the zone of reach. The combining of controls is permissible.

5.2 The controls should be of reliable design and construction and so arranged that they can be operated with ease from the operator's seat within the force limits of table 2.

5.3 Controls, control linkages, hoses and tubes, and connections shall be arranged in such a manner that they are unlikely to be damaged by foreseeable external forces (i.e. used as a step; maximum hand or foot force exerted) and are easily accessible for inspection.

5.4 The distance between control levers, adjacent foot pedals, handles, knobs, the operator's body and other machine parts shall be sufficient to allow operation without unintentional actuation of adjacent controls.

**5.5** The surface of frequently used pedals shall be fitted with skid-resistant type material. Where practical and necessary, the pedals shall have raised edges to reduce the possibility of the foot slipping off the pedal. The pedals may be adjustable.

**5.6** The overlapping of foot pedals is permissible to provide for independent and simultaneous control application.

**5.7** Machine motion controls shall generally be left-hand operated and tool controls shall generally be right-hand operated.

**6 Movement of controls**

**6.1** The movement of tool controls, in relation to their neutral position, shall be in the same general direction as the movement they control, unless customary usage or combining of controls dictates otherwise.

**6.2** Power for movement of the tools shall continue for as long as an action is exerted by the operator on these controls and shall be discontinued automatically as soon as this action ceases. Controls which are retained in a power position but are equipped with an automatic release are acceptable.

**6.3** A diagram<sup>1)</sup> of the controls showing their location, function and direction of operation except those whose function is obvious, i.e. brake pedal, accelerator, shall be placed in the operator area where it is easily visible to the operator.

**7 Control forces**

The following maximum forces in table 2 shall not be exceeded for normal operation. However, these forces may be exceeded on a control for an emergency. The direction of the force shall be referenced to the operator's position while operating the control.

**Table 2 – Control forces**

Controls operated by	Maximum force N
Hand	230 lever, forward/backward 100 lever, sideways 400 brake lever, upwards
Foot	450 pedal 230 treadle - centre pivoted
Toe	90 pedal

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1) Symbols, in accordance with ISO 6405 (at present at the stage of draft), may be used in place of a diagram.