INTERNATIONAL STANDARD

ISO 3789-3

Second edition
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Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Location and method of operation of operator controls —

Part 3:
Controls for powered lawn and garden equipment

Tracteurs, matériels agricoles et forestiers, matériel à moteur pour jardins et pelouses — Emplacement et mode de fonctionnement des commandes de l'opérateur —

Partie 3: Commandes pour matériel à moteur pour jardins et pelouses

Reference number
ISO 3789-3 : 1989 (E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 3789-3 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry.*

This second edition cancels and replaces the first edition (ISO 3789-3 : 1982), and incorporates draft Addendum 1 of 1986.

ISO 3789 consists of the following parts, under the general title *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Location and method of operation of operator controls*:

— *Part 1: Common controls*

— *Part 2: Controls for agricultural tractors and machinery*

— *Part 3: Controls for powered lawn and garden equipment*

— *Part 4: Controls for forestry log loaders*

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Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Location and method of operation of operator controls —

Part 3:
Controls for powered lawn and garden equipment

1 Scope

This part of ISO 3789 specifies the type, location and method of operation (including direction of motion) of the operator controls for powered rotary mowers, including ride-on (riding) types, ride-on (riding) lawn tractors, and lawn and garden tractors with mower attachments, designed primarily for use at and around the home, and having a width of cut greater than 300 mm.

The operator controls location and method of operation specified in this part of ISO 3789 are supplementary to the requirements established in ISO 3789-1.

The operator controls are divided into two categories:

a) ride-on (riding) machines;

b) pedestrian-operated machines.

The controls included in all parts of this International Standard are those which are located at the operator's normal working position and are readily accessible and convenient to the operator.

The common operator controls given in ISO 3789-1 and the operator controls given in this part of ISO 3789 are not required on all machines but, when provided on a machine, they shall conform to the requirements specified herein and in ISO 3789-1.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 3789. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 3789 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3767-1 : 1982, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Symbols for operator controls and other displays — Part 1: Common symbols.*

ISO 3767-3 : 1988, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Symbols for operator controls and other displays — Part 3: Symbols for powered lawn and garden equipment.*

ISO 3789-1 : 1982, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Location and method of operation of operator controls — Part 1: Common controls.*

3 General

The movement of the control, in appropriate circumstances, shall be clearly indicated, in accordance with ISO 3767-3.

4 Type, location and operation of controls

The type, location and method of operation of the operator controls are laid down in table 1 for ride-on (riding) machines and in table 2 for pedestrian-operated machines.

Table 1 — Ride-on (riding) machines

No.	Control	Location	Operation
1	**Engine**		
1.1	**Starting**		It shall be impossible for the engine to be started unless: a) the traction transmission is in neutral or disengaged, and the attachment drive is in neutral or disengaged, or b) the traction clutch is disengaged and the attachment drive is in neutral or disengaged, or c) the operator is in the operator's seat (station). The above method of operation shall apply to machines with electric and manual start; it is optional on manual start only machines. For manual start machines, a durable warning label shall be provided.
1.2	**Speed**		
1.2.1	Foot-operated	Shall be readily accessible to the operator's right foot.	Push pedal forward and/or downward to increase engine speed.
1.2.2	Hand-operated	See ISO 3789-1 : 1982, subclause 1.2.2.	
1.3	**Stop**		
1.3.1	Battery-powered engine starting units	Easily accessible from the operator's seat.	A control with a removable component to prevent unauthorized use of the unit.
1.3.2	Manual start	Easily accessible from the operator's seat.	A means that does not depend on sustained manual pressure.
2	**Steering**	Forward of the operator.	When a steering wheel control is provided, a clockwise rotation shall effect a right turn, and a counterclockwise motion shall effect a left turn. A ride-on mower shall not have a steering control mechanism which requires lateral motion of a handle or a lever in a direction opposite to the direction of turn in such a manner as to cause the operator to move in a direction resulting in decreased vehicle stability during a turn on a slope. Steering control mechanisms should not have sharp protrusions.
3	**Brakes**	See ISO 3789-1 : 1982, subclause 3.1.1.	
3.1	**Service**		
3.1.1	Foot-operated (except when combined with a clutch: see 4.2.1)		When separate brake pedals are provided for the independent right-hand and left-hand brake control, means shall be provided to lock the pedals together.

Table 1 — Ride-on (riding) machines (*continued*)

No.	Control	Location	Operation
3.2	**Parking**		An automatically operated parking brake, when provided, shall be activated when the operator presence control is released. NOTE — The parking brake may be in combination with the service brake.
3.2.1	Hand-operated	Convenient to the operator.	Direction of motion shall be rearward or upward to engage.
3.2.2	Foot-operated	Convenient to the operator.	Depress brake pedal downward or forward to engage.
4	**Clutch, traction drive**		
4.1	**Traction clutch or neutral return** (or both)		
4.1.1	Foot-operated (except when combined with a brake: see 4.2.1)	Convenient to the operator's left foot.	Push pedal forward and/or downward for disengagement, except for operator presence control.
4.1.2	Hand-operated	Within convenient reach of the operator.	The direction of motion shall be generally rearward or toward the operator for disengagement, except for the operator presence control. It shall be overridden by the service brake.
4.1.3	Operator presence control Foot-operated	When provided, a right-foot operator presence control shall be outboard of the service brake pedal.	Drive engagement shall be produced by a forward or downward motion. It shall be overridden by the service brake.
	Seat-activated		When provided, it shall be overridden by the service brake.
4.2	**Traction clutch or neutral return and brake combined**		
4.2.1	Foot-operated (either foot) combination vehicle clutch or neutral return, or both, and brake control		When the control is used, the direction of activation shall be forward, or downward, or both, to cause traction disengagement and brake engagement. Provision shall be made to retain control of the machine during the transition zone of brake disengagement to traction engagement.

Table 1 — Ride-on (riding) machines (*continued*)

No.	Control	Location	Operation
4.3	**Combination ground speed and direction** (continuously variable combined control)		
4.3.1	Foot-operated — one control	See ISO 3789-1 : 1982, subclause 4.2.1.	
4.3.1.1	Foot-operated — two pedal	Convenient to the operator's right foot.	Forward and/or downward motion on the outer pedal shall cause forward motion and increasing forward speed. Forward and/or downward motion on the inner pedal shall cause rearward motion, and increasing rearward speed.
4.3.1.2	Foot-operated — two pedal	Convenient to the operator's feet.	Forward and/or downward motion on the right pedal shall cause forward motion and increasing forward speed. Forward and/or downward motion on the left pedal shall cause rearward motion, and increasing rearward speed. On both types of the two pedal controls (4.3.1.1 and 4.3.1.2) where the control can pass directly from forward to reverse through the neutral position, a "neutral" location shall be provided. For driving on roadways, provision shall be made for a secondary motion to prevent accidental movement of the control.
4.3.2	Hand-operated	See ISO 3789-1 : 1982, subclause 4.2.2.	For interlocks, see subclause 1.1 of this table.
4.4	**Gear selection**		
4.4.1	In-line operation (hand-operated)	See ISO 3789-1 : 1982, subclause 4.3.1.	
4.4.2	Non-in-line operation (hand-operated)	See ISO 3789-1 : 1982, subclause 4.3.2.	
4.5	**Direction control** (forward-reverse, non-variable speed) Hand-operated	See ISO 3789-1 : 1982, subclause 4.4.	
4.6	**Machine attachments**		
4.6.1	Mower attachment clutch (hand-operated)	Convenient to the operator.	The direction for engagement shall be generally forward and/or upward. For disengagement, the direction shall be generally rearward and/or downward. Engagement and/or disengagement of the blade(s) shall be independent from the traction. The direction of engagement and disengagement shall be clearly identified with a durable label.
4.6.2	Mower drive clutch	A mower drive clutch disconnect shall be provided between the engine and the blade(s). For blades directly attached to an electric motor(s), this disconnect shall be between the motor and the power source (battery).	