SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

SURFACE VEHICLE STANDARD

SAE J841

CAN-CELLED JAN1999

Issued 1963-06
Cancelled 1999-01

Superseding J841 DEC84

Operator Controls for Agricultural Wheeled Tractors

1. ***Scope***—These recommendations are intended to improve operator efficiency and convenience by providing guidelines for the uniformity of location and direction of motion of operator controls used on agricultural tractors. The controls covered are those centrally located at the operator's normal position.

2. ***References***

2.1 Applicable Publications—The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated, the latest revision of SAE publications shall apply.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J298—Universal Symbols for Operator Controls on Industrial Equipment
SAE J389—Universal Symbols for Operator Controls on Agricultural Equipment
SAE J1150—Terminology for Agricultural Equipment

3. ***Definitions***

3.1 Agricultural Tractors—See SAE J1150.

3.1.1 Right-hand, left-hand, and forward designations are those related to the operator when sitting in the operating position.

3.1.2 For this standard, the secondary motion requirement is met by an L, Z, or U shaped slot, a slot latch, a thumb button, or other functional designs, but it shall exclude a simple detent alone. When an electrical control switch is used, a partial shield or a spring-loaded shield over that portion of the switch which allows movement from the off position or a secondary motion shall be provided.

4. ***General***

4.1 This recommendation is based on the principle that a given direction of movement of any control produces a consistent and expected effect.

4.2 Where confusion may result from the motion of the control, the effect from movement of the control shall be clearly and permanently identified (see SAE J389).

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-8512 FAX: (724) 776-0243
TO PLACE A DOCUMENT ORDER; (724) 776-4970 FAX: (724) 776-0790
SAE WEB ADDRESS http://www.sae.org

Printed in U.S.A.

5. Brake Control

5.1 The brake pedal(s) shall be actuated by the operator's right foot with the direction of motion forward and/or downward for engagement.

5.2 When separate brake pedals are provided for the independent right-hand and left-hand brake control, it shall be possible to obtain combined and/or equalized control.

5.3 The parking brake or parking device control shall be located convenient to the operator.

6. Clutch Control

6.1 Traction Control

6.1.1 When a foot pedal control is provided, it shall be actuated by the operator's left foot with the direction of motion forward and/or downward for disengagement.

6.1.2 When a hand-operated control is provided, it shall be moved toward the operator (generally rearward) for disengagement.

6.2 Combination Traction Control and Brake Control—When a foot-operated combination traction control and brake control is used, it shall be left-foot operated with the direction of motion to be forward and/or downward to cause clutch disengagement and brake engagement.

6.3 Power Take-Off Control

6.3.1 When a hand-operated clutch control is provided, its movement shall be generally rearward and/or downward for disengagement.

6.3.2 Movement from the off or disengaged position of friction clutch controls shall include secondary motion.

6.3.2.1 Controls for PTO engagement devices such as splined couplings and jaw clutches are excluded from the secondary motion requirement.

6.3.3 The combination traction clutch and constant running or transmission-driven power take-off clutch controls are governed by 6.1.1 and/or 6.1.2.

7. Engine Speed Control

7.1 The engine speed control shall be convenient to the operator.

7.2 When the direction of motion of the engine speed hand control is in a plane parallel to the longitudinal axis of the propelling vehicle, the direction of motion shall be generally forward or upward to increase engine speed.

7.3 When the direction of motion of the engine speed hand control is in a plane parallel to the rim of the steering wheel, the direction of motion shall be rearward and/or downward to increase engine speed.

7.4 On future designs, it is recommended that the engine speed hand control operate as defined in paragraph 7.2.

7.5 When a foot operated engine speed control is provided, it shall be right-foot operated with the direction of motion forward and/or downward to increase engine speed.

8. Ground Speed and Direction Control

8.1 The transmission speed selector lever(s) shall be conveniently located, and the shifting pattern(s) shall be clearly and permanently identified.

8.2 When a hand-operated forward-reverse directional control lever (nonvariable speed) is provided, it shall be moved forward for forward vehicle motion, and be moved generally rearward for rearward vehicle motion. If a neutral position is provided, provisions shall be made to prevent accidental movement of the control.

8.3 When a hand-operated variable speed control is provided, it shall be moved generally forward and/or upward to increase speed.

8.4 Hand-operated combination direction and variable speed ratio control lever(s) shall be operated in one of the following patterns:

8.4.1 The lever shall be moved forward or away from the operator from the neutral position, for forward travel and increasing forward speed. It shall be moved generally rearward or toward the operator, from the neutral position, for rearward travel and increasing rearward speed. Provision shall be made for secondary motion when passing through neutral. A positive neutral position shall be provided.

8.4.2 The lever shall be moved generally forward and away from the operator, from a neutral position, for forward speed. For rearward travel, the lever shall be moved laterally through a neutral position, and then forward and/or away from the operator for increased rearward speed. A positive neutral position shall be provided.

8.5 If a foot-actuated directional and variable speed control is provided, two pedals shall be used. Forward or downward motion on the outer pedal shall produce reverse motion and forward or downward motion on the inner pedal shall produce forward motion. Forward or downward motion of either pedal shall increase speed and either pedal shall return to neutral upon release of foot pressure. All direction and variable speed control pedals shall be clearly and permanently identified to indicate their function. A positive neutral position or control shall be provided.

8.6 An interlock shall be provided which prevents the engine from being started unless (a) the transmission selector lever is in a neutral position, or (b) the transmission clutch is disengaged, or (c) the combination direction and speed control is in a neutral position.

8.7 When a differential lock control is provided, it shall be moved forward or downward for engagement.

9. ***Lift Control Levers for Implements or Equipment***—Lift control lever(s) intended for movement from the operator's station shall be convenient to the operator and shall be clearly and permanently identified. The control(s) should be located on the right-hand side of the operator.

9.1 When a hand control is provided, the direction of motion shall be generally forward or downward to lower and rearward or upward to raise the implement or equipment.

10. Steering Control

10.1 When a steering wheel control is provided, a clockwise rotation shall effect a right turn and counterclockwise rotation shall effect a left turn.

11. Engine Stop Control

11.1 The engine stop control shall be located convenient to the operator.

11.2 The control or the stop position for the control shall be labeled as "engine stop" and/or with the symbol for fuel shut-off per SAE J298.

11.3 The control shall remain in the stop position without the application of sustained manual effort.

11.4 Types of controls and additional requirements:

11.4.1 When a key switch stop control is used, the rotation to stop shall be counterclockwise.

11.4.2 When a push-pull stop control is used:

11.4.2.1 Direction of movement shall be pull to stop.

11.4.2.2 The color of the control shall be red and contrast with the immediate background.

11.4.2.3 It shall be located near the key switch or instruction on how to stop the engine shall be near the key switch.

11.4.3 When the stop control is combined with the engine speed control:

11.4.3.1 The stop position shall be in the direction of and beyond low idle.

11.4.3.2 Instructions for stopping shall be provided near the key switch.

11.4.3.3 The color of the control shall be red and contrast with the immediate background.

PREPARED BY THE SAE HUMAN FACTORS TECHNICAL COMMITTEE SC1—
MACHINE CONTROLS—OPERATOR