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lbs, school buses, police vehicles as defined in S7 of Standard No. 208 (49 CFR 571.208), firefighting vehicles, ambulances, or motor homes. To determine the number of passenger seating positions in school buses, see S4.1 of Standard No. 222 (49 CFR 571.222).

(b) *Number of designated seating positions.* The formula for calculating the number of designated seating positions (N) for any seat location with a seating surface width greater than 330 mm (13 inches) is as follows:

(1) For seat locations with a seating surface width, as described in paragraph (c), of less than 1400 mm (55.2 inches): N = [Seating surface width (in mm)/350] round down to the nearest whole number;

(2) For seat locations with a seating surface width, as described in paragraph (c), greater than or equal to 1400 mm (55.2 inches): N = [Seating surface width (in mm)/450] round down to the nearest whole number.

(c) *Seating surface measurement.* (1) As used in this section, ''seating surface width'' is the maximum width of a seating surface measured in a zone extending from a transverse vertical plane 150 mm (5.9 inches) behind the front leading surface of that seating surface to a transverse vertical plane 250 mm (9.8 inches) behind that front leading surface, measured horizontally and longitudinally.

(2) Adjacent seating surfaces are considered to form a single, continuous seating surface whose overall width is measured as specified in (c)(1) of this section, unless

(i) The seating surfaces are separated by:

(A) A fixed trimmed surface whose top surface is unpadded and that has a width not less than 140 mm (5.5 inches), as measured in each transverse vertical plane within that measurement zone, or

(B) A void whose cross section in each transverse vertical plane within that measurement zone is a rectangle that is not less than 140 mm (5.5 inches) wide and not less than 140 mm (5.5 inches) deep. The top edge of the cross section in any such plane is congruent with the transverse horizontal line that intersects the lowest point on the portion of the top profile of the seating surfaces that lie within that plane, or

(ii) Interior trim interrupts the measurement of the nominal hip room of the seating surfaces, measured laterally along the ''X'' plane through the H-point. For purposes of this paragraph, the H-point is located using the SAE three-dimensional H-point machine per Society of Automotive Engineers (SAE) Surface Vehicle Standard J826, revised July 1995, ''Devices for Use in Defining and Measuring Vehicle Seating Accommodation'' (incorporated by reference, see section 571.5) with the legs and leg weights removed, or

(iii) The seating surfaces are adjacent outboard seats, and the lateral distance between any point on the seat cushion of one seat and any point on the seat cushion of the other seat is not less than 140 mm (5.5 inches).

(3) Folding, removable, and adjustable seats are measured in the configuration that results in the single largest maximum seating surface width.

[73 FR 58897, Oct. 8, 2008, as amended at 74 FR 68190, Dec. 23, 2009]

Subpart B—Federal Motor Vehicle Safety Standards

SOURCE: 36 FR 22902, Dec. 2, 1971, unless otherwise noted.

§ 571.101 Standard No. 101; Controls and displays.

S1. *Scope.* This standard specifies performance requirements for location, identification, color, and illumination of motor vehicle controls, telltales and indicators.

S2. *Purpose.* The purpose of this standard is to ensure the accessibility, visibility and recognition of motor vehicle controls, telltales and indicators, and to facilitate the proper selection of controls under daylight and nighttime conditions, in order to reduce the safety hazards caused by the diversion of the driver's attention from the driving task, and by mistakes in selecting controls.

S3. *Application.* This standard applies to passenger cars, multipurpose passenger vehicles, trucks, and buses.

S4. *Definitions.*

Adjacent, with respect to a control, telltale or indicator, and its identifier means:

(a) The identifier is in close proximity to the control, telltale or indicator; and

(b) No other control, telltale, indicator, identifier or source of illumination appears between the identifier and the telltale, indicator, or control that the identifier identifies.

Common space means an area on which more than one telltale, indicator, identifier, or other message may be displayed, but not simultaneously.

Control means the hand-operated part of a device that enables the driver to change the state or functioning of the vehicle or a vehicle subsystem.

Indicator means a device that shows the magnitude of the physical characteristics that the instrument is designed to sense.

Identifier means a symbol, word, or words used to identify a control, telltale, or indicator.

Multi-function control means a control through which the driver may select, and affect the operation of, more than one vehicle function.

Multi-task display means a display on which more than one message can be shown simultaneously.

Telltale means an optical signal that, when illuminated, indicates the actuation of a device, a correct or improper functioning or condition, or a failure to function.

S5. *Requirements.* Each passenger car, multipurpose passenger vehicle, truck and bus that is fitted with a control, a telltale or an indicator listed in Table 1 or Table 2 must meet the requirements of this standard for the location, identification, color, and illumination of that control, telltale or indicator. However, the requirements for telltales and indicators do not apply to vehicles with GVWRs of 4,536 kg or greater if these specified vehicles are manufactured before September 1, 2013.

S5.1 Location

S5.1.1 The controls listed in Table 1 and in Table 2 must be located so they are operable by the driver under the conditions of S5.6.2.

S5.1.2 The telltales and indicators listed in Table 1 and Table 2 and their identification must be located so that, when activated, they are visible to a driver under the conditions of S5.6.1 and S5.6.2.

S5.1.3 Except as provided in S5.1.4, the identification for controls, telltales and indicators must be placed on or adjacent to the telltale, indicator or control that it identifies.

S5.1.4 The requirement of S5.1.3 does not apply to a multi-function control, provided the multi-function control is associated with a multi-task display that:

(a) Is visible to the driver under the conditions of S5.6.1 and S5.6.2,

(b) Identifies the multi-function control with which it is associated graphically or using words,

(c) For multi-task displays with layers, identifies on the top-most layer each system for which control is possible from the associated multi-function control, including systems not otherwise regulated by this standard. Subfunctions of the available systems need not be shown on the top-most layer of the multi-task display, and

(d) Identifies the controls of Table 1 and Table 2 with the identification specified in those tables or otherwise required by this standard, whenever those are the active functions of the multi-function control. For lower levels of multi-task displays with layers, identification is permitted but not required for systems not otherwise regulated by this standard.

(e) Does not display telltales listed in Table 1 or Table 2.

S5.2 Identification

S5.2.1 Except for the Low Tire Pressure Telltale, each control, telltale and indicator that is listed in column 1 of Table 1 or Table 2 must be identified by the symbol specified for it in column 2 or the word or abbreviation specified for it in column 3 of Table 1 or Table 2. If a symbol is used, each symbol provided pursuant to this paragraph must be substantially similar in form to the symbol as it appears in Table 1 or Table 2. If a symbol is used, each symbol provided pursuant to this paragraph must have the proportional dimensional characteristics of the symbol as it appears in Table 1 or Table 2. The Low Tire Pressure Telltale (either

the display identifying which tire has low pressure or the display which does not identify which tire has low pressure) shall be identified by the appropriate symbol designated in column 4, or both the symbol in column 4 and the words in column 3. No identification is required for any horn (*i.e.*, audible warning signal) that is activated by a lanyard or by the driver pressing on the center of the face plane of the steering wheel hub; or for a turn signal control that is operated in a plane essentially parallel to the face plane of the steering wheel in its normal driving position and which is located on the left side of the steering column so that it is the control on that side of the column nearest to the steering wheel face plane. However, if identification is provided for a horn control in the center of the face plane of the steering wheel hub, the identifier must meet Table 2 requirements for the horn.

S5.2.2 Any symbol, word, or abbreviation not shown in Table 1 or Table 2 may be used to identify a control, a telltale or an indicator that is not listed in those tables.

S5.2.3 Supplementary symbols, words, or abbreviations may be used at the manufacturer's discretion in conjunction with any symbol, word, or abbreviation specified in Table 1 or Table 2.

S5.2.4 [Reserved]

S5.2.5 A single symbol, word, or abbreviation may be used to identify any combination of the control, indicator, and telltale for the same function.

S5.2.6 Except as provided in S5.2.7, all identifications of telltales, indicators and controls listed in Table 1 or Table 2 must appear to the driver to be perceptually upright. A rotating control that has an ''off'' position shall appear to the driver perceptually upright when the rotating control is in the ''off'' position.

S5.2.7 The identification of the following items need not appear to the driver to be perceptually upright:

(a) A horn control;

(b) Any control, telltale or indicator located on the steering wheel, when the steering wheel is positioned for the motor vehicle to travel in a direction other than straight forward; and

(c) Any rotating control that does not have an ''off'' position.

S5.2.8 Each control for an automatic vehicle speed system (cruise control) and each control for heating and air conditioning systems must have identification provided for each function of each such system.

S5.2.9 Each control that regulates a system function over a continuous range must have identification provided for the limits of the adjustment range of that function. If color coding is used to identify the limits of the adjustment range of a temperature function, the hot limit must be identified by the color red and the cold limit by the color blue. If the status or limit of a function is shown by a display not adjacent to the control for that function, both the control (unless it is a multi-function control complying with S5.1.4) and the display must be independently identified as to the function of the control, in compliance with S5.2.1, on or adjacent to the control and on or adjacent to the display.

Example 1. A slide lever controls the temperature of the air in the vehicle heating system over a continuous range, from no heat to maximum heat. Since the control regulates a single function over a quantitative range, only the extreme positions require identification.

Example 2. A switch has three positions, for heat, defrost, and air conditioning. Since each position regulates a different function, each position must be identified.

S5.3 Illumination

S5.3.1 Timing of illumination

(a) Except as provided in S5.3.1(c), the identifications of controls for which the word ''Yes'' is specified in column 5 of Table 1 must be capable of being illuminated whenever the headlamps are activated. This requirement does not apply to a control located on the floor, floor console, steering wheel, steering column, or in the area of windshield header, or to a control for a heating and air-conditioning system that does not direct air upon the windshield.

(b) Except as provided in S5.3.1(c), the indicators and their identifications for which the word ''Yes'' is specified

in column 5 of Table 1 must be illuminated whenever the vehicle's propulsion system and headlamps are activated.

(c) The indicators, their identifications and the identifications of controls need not be illuminated when the headlamps are being flashed or operated as daytime running lamps.

(d) At the manufacturer's option, any control, indicator, or their identifications may be capable of being illuminated at any time.

(e) A telltale must not emit light except when identifying the malfunction or vehicle condition it is designed to indicate, or during a bulb check.

S5.3.2 Brightness of illumination of controls and indicators

S5.3.2.1 Means must be provided for illuminating the indicators, identifications of indicators and identifications of controls listed in Table 1 to make them visible to the driver under daylight and nighttime driving conditions.

S5.3.2.2 The means of providing the visibility required by S5.3.2.1:

(a) Must be adjustable to provide at least two levels of brightness;

(b) At a level of brightness other than the highest level, the identification of controls and indicators must be barely discernible to the driver who has adapted to dark ambient roadway condition;

(c) May be operable manually or automatically; and

(d) May have levels of brightness, other than the two required visible levels of brightness, at which those items and identification are not visible.

(1) If the level of brightness is adjusted by automatic means to a point where those items or their identification are not visible to the driver, means shall be provided to enable the driver to restore visibility.

S5.3.3 Brightness of telltale illumination

(a) Means must be provided for illuminating telltales and their identification sufficiently to make them visible to the driver under daylight and nighttime driving conditions.

(b) The means for providing the required visibility may be adjustable manually or automatically, except that the telltales and identification for brakes, highbeams, turn signals, and safety belts may not be adjustable under any driving condition to a level that is invisible.

S5.3.4 *Brightness of interior lamps.* (a) Any source of illumination within the passenger compartment which is forward of a transverse vertical plane 110 mm rearward of the manikin ''H'' point with the driver's seat in its rearmost driving position, which is not used for the controls and displays regulated by this standard, which is not a telltale, and which is capable of being illuminated while the vehicle is in motion, shall have either:

(1) Light intensity which is manually or automatically adjustable to provide at least two levels of brightness;

(2) A single intensity that is barely discernible to a driver who has adapted to dark ambient roadway conditions;or

(3) A means of being turned off.

(b) Paragraph (a) of S5.3.4 does not apply to buses that are normally operated with the passenger compartment illuminated.

S5.3.5 The provisions of S5.3.4 do not apply to buses that are normally operated with the passenger compartment illuminated.

S5.4 Color

S5.4.1 The light of each telltale listed in Table 1 must be of the color specified for that telltale in column 6 of that table.

S5.4.2 Any indicator or telltale not listed in Table 1 and any identification of that indicator or telltale must not be a color that masks the driver's ability to recognize any telltale, control, or indicator listed in Table 1.

S5.4.3 Each identifier used for the identification of a telltale, control or indicator must be in a color that stands out clearly against the background. However, this requirement does not apply to an identifier for a horn control in the center of the face plane of the steering wheel hub. For vehicles with a GVWR of under 4,536 kg (10,000 pounds), the compliance date for this provision is September 1, 2011. For vehicles with a GVWR of 4,536 kg (10,000 pounds) or over, the compliance date for this provision is September 1, 2013.

S5.5 Common space for displaying multiple messages

S5.5.1 A common space may be used to show messages from any sources, subject to the requirements in S5.5.2 through S5.5.6.

S5.5.2 The telltales for any brake system malfunction required by Table 1 to be red, air bag malfunction, low tire pressure, electronic stability control malfunction (as of September 1, 2011), passenger air bag off, high beam, turn signal, and seat belt must not be shown in the same common space.

S5.5.3 The telltales and indicators that are listed in Table 1 and are shown in the common space must illuminate at the initiation of any underlying condition.

S5.5.4 Except as provided in S5.5.5, when the underlying conditions exist for actuation of two or more telltales, the messages must be either:

(a) Repeated automatically in sequence, or

(b) Indicated by visible means and capable of being selected for viewing by the driver under the conditions of S5.6.2.

S5.5.5 In the case of the telltale for a brake system malfunction, air bag malfunction, side air bag malfunction, low tire pressure, electronic stability control malfunction (as of September 1, 2011), passenger air bag off, high beam, turn signal, or seat belt that is designed to display in a common space, that telltale must displace any other symbol or message in that common space while the underlying condition for the telltale's activation exists.

S5.5.6(a) Except as provided in S5.5.6(b), messages displayed in a common space may be cancelable automatically or by the driver.

(b) Telltales for high beams, turn signal, low tire pressure, and passenger air bag off, and telltales for which the color red is required in Table 1 must not be cancelable while the underlying condition for their activation exists.

S5.6 Conditions

S5.6.1 The driver has adapted to the ambient light roadway conditions.

S5.6.2 The driver is restrained by the seat belts installed in accordance with 49 CFR 571.208 and adjusted in accordance with the vehicle manufacturer's instructions.

Table 1
Controls, Telltales, and Indicators
With Illumination or Color Requirements[1]

Column 1 ITEM	Column 2 SYMBOL	Column 3 WORDS OR ABBRE-VIATIONS	Column 4 FUNCTION	Column 5 ILLUMIN-ATION	Column 6 COLOR
Highbeam [2]	[3,5]	—	Telltale	—	Blue or Green [4]
Turn signals [2]	[3,6]	—	Control	—	—
			Telltale	—	Green [4]
Hazard warning signal	[3]	Hazard	Control	Yes	—
		—	Telltale [7]	—	—
Position, side marker, end-outline marker, identification, or clearance lamps	[3] [8]	Marker Lamps or MK Lps [8]	Control	Yes	—
Windshield wiping system		Wiper or Wipe	Control	Yes	—
Windshield washing system		Washer or Wash	Control	Yes	—
Windshield washing and wiping system combined		Washer-Wiper or Wash-Wipe	Control	Yes	—
Windshield defrosting and defogging system		Defrost, Defog or Def.	Control	Yes	—
Rear window defrosting and defogging system		Rear Defrost, Rear Defog, Rear Def., or R-Def.	Control	Yes	—

Table 1
Controls, Telltales, and Indicators
With Illumination or Color Requirements[1]

Column 1 ITEM	Column 2 SYMBOL	Column 3 WORDS OR ABBRE-VIATIONS	Column 4 FUNCTION	Column 5 ILLUMIN-ATION	Column 6 COLOR
Brake system malfunction	—	Brake	Telltale	—	Red[4]
Antilock brake system malfunction for vehicles subject to FMVSS 105 or 135	—	Antilock, Anti-lock, or ABS [9]	Telltale	—	Yellow
Malfunction in Variable Brake Proportioning System	—	Brake Proportioning [9]	Telltale	—	Yellow
Regenerative brake system malfunction	—	RBS or ABS/RBS [9]	Telltale	—	Yellow
Malfunction in antilock system for vehicles other than trailers subject to FMVSS 121	—	ABS or Antilock [9]	Telltale	—	Yellow
Antilock brake system trailer fault for vehicles subject to FMVSS 121	ABS	Trailer ABS or Trailer Antilock	Telltale	—	Yellow
Brake Pressure (for vehicles subject to FMVSS 105 or 135)	—	Brake Pressure [9]	Telltale	—	Red[4]
Low brake fluid condition (for vehicles subject to FMVSS 105 or 135)	—	Brake Fluid [9]	Telltale	—	Red[4]
Parking brake applied (for vehicles subject to FMVSS 105 or 135)	—	Park or Parking Brake [9]	Telltale	—	Red[4]
Brake lining wear-out condition (for vehicles subject to FMVSS 135)	—	Brake Wear [9]	Telltale	—	Red[4]
Electronic Stability Control System Malfunction (manufacturer may use this telltale in flashing mode to indicate ESC operation. See FMVSS 126.) [10]		ESC [11]	Telltale	—	Yellow
Electronic Stability Control System "OFF" [10]	OFF	ESC OFF	Control	Yes	—
			Telltale	—	Yellow

Table 1
Controls, Telltales, and Indicators
With Illumination or Color Requirements[1]

Column 1 ITEM	Column 2 SYMBOL	Column 3 WORDS OR ABBRE-VIATIONS	Column 4 FUNCTION	Column 5 ILLUMIN-ATION	Column 6 COLOR
Fuel Level	or	Fuel	Telltale	—	—
			Indicator	Yes	—
Engine oil pressure	[12]	Oil	Telltale	—	—
			Indicator	Yes	—
Engine coolant temperature	[12]	Temp	Telltale	—	—
			Indicator	Yes	—
Electrical charge		Volts or Charge or Amp	Telltale	—	—
			Indicator	Yes	—
Engine stop	—	Engine Stop [13]	Control	Yes	—
Automatic vehicle speed (cruise control)	—	—	Control	Yes	—
Speedometer	—	MPH, or MPH and km/h [14]	Indicator	Yes	—
Heating and Air conditioning system	—	—	Control	Yes	—
Automatic transmission control position *(park)* *(reverse)* *(neutral)* *(drive)*	—	P R N D [15]	Indicator	Yes	—
Heating and/or air conditioning fan	or	Fan	Control	Yes	—
Low Tire Pressure (including malfunction) (See FMVSS 138)	[16]	Low Tire [16]	Telltale	—	Yellow

Table 1
Controls, Telltales, and Indicators
With Illumination or Color Requirements[1]

Column 1 ITEM	Column 2 SYMBOL	Column 3 WORDS OR ABBRE-VIATIONS	Column 4 FUNCTION	Column 5 ILLUMIN-ATION	Column 6 COLOR
Low Tire Pressure (including malfunction) that identifies involved tire (See FMVSS 138)	[16]	Low Tire [16]	Telltale	—	Yellow
Tire Pressure Monitoring System Malfunction (See FMVSS 138)[17]	—	TPMS [16, 18]	Telltale	—	Yellow

Notes:

1. An identifier is shown in this table if it is required for a control for which an illumination requirement exists or if it is used for a telltale for which a color requirement exists. If a line appears in column 2 and column 3, the control, telltale or indicator is required to be identified, however the form of the identification is the manufacturer's option. Telltales are not considered to have an illumination requirement, because by definition the telltale must light when the condition for its activation exists.
2. Additional requirements in FMVSS 108.
3. Framed areas of the symbol may be solid; solid areas may be framed.
4. Blue may be blue-green. Red may be red-orange.
5. Symbols employing four lines instead of five may also be used.
6. The pair of arrows is a single symbol. When the controls or telltales for left and right turn operate independently, however, the two arrows may be considered separate symbols and be spaced accordingly.
7. Not required when arrows of turn signal telltales that otherwise operate independently flash simultaneously as hazard warning telltale.
8. Separate identification not required if function is combined with master lighting switch.
9. Refer to FMVSS 105 or FMVSS 135, as appropriate, for additional specific requirements for brake telltale labeling and color. If a single telltale is used to indicate more than one brake system condition, the brake system malfunction identifier must be used.
10. Requirement effective September 1, 2011.
11. This symbol may also be used to indicate the malfunction of related systems/functions, including traction control, trailer stability assist, corner brake control, and other similar functions that use throttle and/or individual wheel torque control to operate and share common components with ESC.
12. Combination of the engine oil pressure symbol and the engine coolant temperature symbol in a single telltale is permitted.
13. Use when engine control is separate from the key locking system.
14. If the speedometer is graduated in both miles per hour and in kilometers per hour, the scales must be identified "MPH" and "km/h", respectively, in any combination of upper- and lowercase letters.
15. The letters 'P', 'R', 'N', and 'D' are considered separate identifiers for the individual gear positions. Their locations within the vehicle, and with respect to each other, are governed by FMVSS 102. The letter 'D' may be replaced by another alphanumeric character or symbol chosen by the manufacturer.
16. Required only for FMVSS 138 compliant vehicles.
17. Alternatively, either low tire pressure telltale may be used to indicate a TPMS malfunction. See FMVSS 138.
18. Required only for vehicles manufactured on or after September 1, 2007.

Table 2
Identifiers for
Controls, Telltales and Indicators with
No Color or Illumination Requirements

Column 1 ITEM	Column 2 SYMBOL	Column 3 WORD(S) OR ABBREVIATION
Hand Throttle Control	—	Throttle
Engine Start Control	—	Engine Start[1]
Manual Choke Control	—	Choke
Odometer	—	Kilometers or km, if kilometers are shown. Otherwise, no identifier is required. [2]
Horn		Horn
Master Lighting Switch	[3]	Lights
Headlamps and Taillamps Control	—	— [4,5]
Low Brake Air Pressure Telltale (for vehicles subject to FMVSS 121)	—	Brake Air
Seat Belt Unfastened Telltale		Fasten Belts or Fasten Seat Belts

Notes:

1. Use when engine control is separate from the key locking system.
2. Any combination of upper- or lowercase letters may be used.
3. Framed areas may be filled.
4. If a line appears in Column 2 and Column 3, the Control, Telltale or Indicator is required to be identified, however the form of the identification is the manufacturer's option.
5. Separate identification not required if function is combined with Master Lighting Switch.

[70 FR 48305, Aug. 17, 2005, as amended at 71 FR 27971, May 15, 2006; 72 FR 17305, Apr. 6, 2007; 73 FR 54537, Sept. 22, 2008; 74 FR 40764, Aug. 13, 2009]