PVGTR Proposal for Parking Brake Requirements (was PVGTRswg2-1b) **PVGTR2004-12**(park brake)

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PB/TSH

The text set in *italics* is for clarification ("justification") only and is not part of wording for the proposal.

Proposal	**Actual Text in ECE R 13H**	**Actual Text in FMVSS 135**
Each vehicle shall be equipped with a parking braking system which must make it possible to hold the vehicle stationary on an up or down gradient even in the absence of the driver, the working parts being then held in the locked position by a purely mechanical device. The driver must be able to achieve this braking action from his driving seat.	5.1.2.3. Parking braking system The parking braking system must make it possible to hold the vehicle stationary on an up or down gradient even in the absence of the driver, the working parts being then held in the locked position by a purely mechanical device. The driver must be able to achieve this braking action from his driving seat.	S5.2. Parking brake system. Each vehicle shall be equipped with a parking brake system **of a friction type** with solely mechanical means to retain engagement.
The control of the parking brake shall be independent of the service brake control, and may be either a hand or foot control. The service braking system and the parking braking system may use common components including the transmission(s), provided that in the event of a failure in any component or part of the transmission(s) the requirements for secondary braking are still ensured; [The parking braking system must be so designed that it can be actuated when the vehicle is in motion or actuation under that condition shall be prevented]	5.2.2. The systems providing service, secondary and parking braking may have common components so long as they fulfil the following conditions: 5.2.2.1. there must be at least two controls, independent of each other and readily accessible to the driver from his normal driving position. Every brake control shall be designed such that it returns to the fully off position when released. This requirement shall not apply to a parking brake control when it is mechanically locked in an applied position; 5.2.2.2. the control of the service braking system must be independent of the control of the parking braking system; 5.2.2.4. the parking braking system must be so designed that it can be actuated when the vehicle is in motion. This requirement may be met by the actuation of the vehicle's service braking system, even partially, by means of an auxiliary control. 5.2.2.5. without prejudice to the requirements of paragraph 5.1.2.3. of this Regulation, the service braking system and the parking braking system may use common components in their transmission(s), provided	S5.3.1. The service brakes shall be activated by means of a foot control. The control of the parking brake shall be independent of the service brake control, and may be either a hand or foot control.

	that in the event of a failure in any part of the transmission(s) the requirements for secondary braking are still ensured;	
The application of the parking brake shall be indicated to the driver by a red warning signal. The same tell-tale signal as used for the service brake may be used. (alternative wording: The red warning signal specified in Par. xxx may be used.)	5.2.3. The failure of a part of a hydraulic transmission system shall be signalled …. Application of the parking brake must also be indicated to the driver. The same tell-tale signal may be used.	S5.5. Brake system warning indicator. S5.5.1. Activation. An indicator shall be activated when the ignition (start) switch is in the "on" ("run") position and whenever any of conditions (a) through (g) occur: (c) Application of the parking brake. S5.5.2. Function check. (2) A single manual action by the driver, such as momentary activation of a test button or switch mounted on the instrument panel in front of and in clear view of the driver, or, in the case of an indicator for application of the parking brake, by applying the parking brake when the ignition is in the "on" ("run") position. S5.5.5. Labeling. 4) If a separate indicator is provided for application of the parking brake as specified for S5.5.1(c), the single word "Park" or the words "Parking Brake" may be used.

Necessary? Needed only for regenerative braking?	5.2.10. The service, secondary and parking braking systems must act on braking surfaces connected to the wheels through components of adequate strength. Disconnection of the braking surface of the parking braking system shall be permitted only on condition that the disconnection is controlled exclusively by the driver from his driving seat, by a system incapable of being brought into action by a leak.	
Not needed, only for "servo" parking brake	5.2.14.3. This acoustic device may be rendered inoperative while the parking brake is applied and/or, at the choice of the manufacturer, in the case of automatic transmission the selector is in the "Park" position. 5.2.15. Without prejudice to the requirements of paragraph 5.1.2.3. above, where an auxiliary source of energy is essential to the functioning of a braking system, the reserve of energy must be such as to ensure that, if the engine stops or in the event of a failure of the means by which the energy source is driven, the braking performance remains adequate to bring the vehicle to a halt in the prescribed conditions. In addition, if the muscular effort applied by the driver to the parking braking system is reinforced by a servo device, the actuation of parking braking must be ensured in the event of a failure of the servo device, if necessary by using a reserve of energy independent of that normally supplying the servo device. This reserve of energy may be that intended for the service braking system.	
In the case of a failure within the electric transmission, any unintended actuation of the parking braking system shall be prevented;	5.2.19.1. In the case of a failure within the electric transmission, any unintended actuation of the parking braking system shall be prevented;	*no requirements for EPB*
	5.2.19.2. In the case of a break in the wiring within the electric control transmission external to the electronic	*no requirements for EPB*

Present requirements for the EPB are overloaded. One outcome in the EBSII discussions was that a parking brake is not a safety system. It is only a comfort system as the driver can always park his car in a safe condition as long as he is aware whether the parking brake works properly or not. So redundancy requirements may be deleted and instead of it requirements for a perfect failure information should be introduced. In FMVSS there are no requirements for EPB at all. [In the case of a failure, which prevents the release of the parking brake by use of the control from the drivers seat, at least release shall be possible by the use of tools and/or an auxiliary device carried/fitted on the vehicle.] *The need for an auxiliary release device should not be mandated. The market shall regulate that.*	control unit(s) and excluding the energy supply, or a failure in the control, it shall remain possible to apply the parking braking system from the driver's seat and thereby be capable of holding the laden vehicle stationary on an 8 per cent up or down gradient. Alternatively, in this case, an automatic actuation of the parking brake is allowed when the vehicle is stationary, provided that the above performance is achieved and, once applied, the parking brake remains engaged independently of the status of the ignition (start) switch. In this alternative, the parking brake shall be automatically released as soon as the driver starts to set the vehicle in motion again. The engine/manual transmission or the automatic transmission (park position) may be used to achieve or assist in achieving the above performance. It shall also be possible to release the parking braking system, if necessary by the use of tools and/or an auxiliary device carried/fitted on the vehicle.	
Any [electrical] failure excluding the energy supply which precludes actuation of the parking brake shall be signalled to the driver.	5.2.19.2.1. A break in the wiring within the electric transmission, or a failure in the control of the parking braking system shall be signalled to the driver by the yellow warning signal specified in paragraph 5.2.21.1.2. When caused by a break in the wiring within the electric control transmission of the parking braking system, this yellow warning signal shall be signalled as soon as the break occurs. In addition, such a failure in the control or break in the wiring external to the electronic control unit(s) and excluding the energy supply shall be signalled to the driver by flashing the red warning signal specified in paragraph 5.2.21.1.1. as long as the ignition (start) switch is in the "on" (run) position including a period of not less than 10 seconds thereafter and the control is in the "on" (activated) position. Where actuation of the parking brake is normally indicated by a separate red warning signal, satisfying all the	*no requirements for EPB*

	requirements of paragraph 5.2.21.2., this signal shall be used to satisfy the above requirement for a red signal.	
To be replaced by a more general Paragraph applicable to other "primary" equipment.	5.2.19.3. Auxiliary equipment may draw its energy from the energy reserve of the electric transmission of the parking braking system, provided that the actuation of the parking braking system will not be affected. In addition, where the energy reserve is also used by the service braking system, the requirements of paragraph 5.2.20.6. below shall apply;	*no requirements for EPB*
After the ignition/start switch which controls the electrical energy for the braking equipment has been switched off and/or the key removed, it shall remain possible to apply the parking braking system, whereas releasing shall be prevented.	5.2.19.4. After the ignition/start switch which controls the electrical energy for the braking equipment has been switched off and/or the key removed, it shall remain possible to apply the parking braking system, whereas releasing shall be prevented.	*no requirements for EPB*
Requirements for test procedures to be covered in test procedures for self certification only for US.	No requirements for testing	S7.12. Parking brake. S7.12.1. Vehicle conditions. (a) Vehicle load: GVWR only. (b) Transmission position: In neutral. (c) Parking brake burnish: (1) For vehicles with parking brake systems not utilizing the service friction elements, the friction elements of such a system are burnished prior to the parking brake test according to the published recommendations furnished to the purchaser by the manufacturer. (2) If no recommendations are furnished, the vehicle's parking brake system is tested in an unburnished condition. (d) Parking brake applications: 1 application and up to 2 reapplications, if necessary. S7.12.2. *Test conditions and procedures*. (a) IBT: (1) Parking brake systems utilizing service brake friction materials shall be tested with the IBT ≤100 deg.C (212 deg.F) and shall have no additional

		burnishing or artificial heating prior to the start of the parking brake test. (2) Parking brake systems utilizing non-service brake friction materials shall be tested with the friction materials at ambient temperature at the start of the test. The friction materials shall have no additional burnishing or artificial heating prior to or during the parking brake test.
The parking braking system must be capable of holding the laden vehicle stationary on a 20 per cent up or down gradient.	Annex 3; 2.3.1. The parking braking system must be capable of holding the laden vehicle stationary on a 20 per cent up or down gradient.	(b) Parking brake control force: Hand control ≤400 N (89.9 lbs); foot control ≤500 N (112.4 lbs). (c) Hand force measurement locations: The force required for actuation of a hand-operated brake system is measured at the center of the hand grip area or at a distance of 40 mm (1.57 in) from the end of the actuation lever as illustrated in Figure 3. (d) Parking brake applications: 1 application and up to 2 reapplications, if necessary. (e) Test surface gradient: 20% grade. (f) Drive the vehicle onto the grade with the longitudinal axis of the vehicle in the direction of the slope of the grade. (g) Stop the vehicle and hold it stationary by applying the service brake control and place the transmission in neutral. (h) With the service brake applied sufficiently to just keep the vehicle from rolling, apply the parking brake as specified in S7.12.2(i) or S7.12.2(j). (i) For a vehicle equipped with mechanically-applied parking brakes, make a single application of the parking brake control with a force not exceeding the limits specified in S7.12.2(b). For a vehicle using an electrically-activated parking brake, apply the parking brake by activating the parking brake

		control. (j) In the case of a parking brake system that does not allow application of the specified force in a single application, a series of applications may be made to achieve the specified force. (k) Following the application of the parking brakes, release all force on the service brake control and, if the vehicle remains stationary, start the measurement of time. (l) If the vehicle does not remain stationary, reapplication of a force to the parking brake control at the level specified in S7.12.2(b) as appropriate for the vehicle being tested (without release of the ratcheting or other holding mechanism of the parking brake) is used up to two times to attain a stationary position. (m) Verify the operation of the parking brake application indicator. (n) Following observation of the vehicle in a stationary condition for the specified time in one direction, repeat the same test procedure with the vehicle orientation in the opposite direction on the same grade. S7.12.3. Performance requirement. The parking brake system shall hold the vehicle stationary for 5 minutes in both a forward and reverse direction on the grade.
On vehicles to which the coupling of a trailer is authorized, the parking braking system of the motor vehicle must be capable of holding the combination of vehicles stationary on a 12 per cent up or down gradient.	Annex 3; 2.3.2. On vehicles to which the coupling of a trailer is authorized, the parking braking system of the motor vehicle must be capable of holding the combination of vehicles stationary on a 12 per cent up or down gradient.	*no requirements*
If the control device is manual, the force applied to it must not exceed 40 daN.	Annex 3; 2.3.3. If the control device is manual, the force applied to it must not exceed 40 daN.	See above: (b) Parking brake control force: Hand control ≤400 N (89.9 lbs); foot control ≤500 N (112.4 lbs).

If it is a foot control device, the force exerted on the control must not exceed 50 daN.	Annex 3; 2.3.4. If it is a foot control device, the force exerted on the control must not exceed 50 daN.	See above: (b) Parking brake control force: Hand control ≤400 N (89.9 lbs); foot control ≤500 N (112.4 lbs).
Not needed for PV	Annex 3; 2.3.5. A parking braking system which has to be actuated several times before it attains the prescribed performance is admissible.	*not specified*
Not needed since requirement for dynamic application is deleted	Annex 3; 2.3.6. To check compliance with the requirement specified in paragraph 5.2.2.4. of this Regulation, a Type-0 test must be carried out, with the engine disconnected, at an initial test speed of 30 km/h. The mean fully developed deceleration on application of the control of the parking brake system and the deceleration immediately before the vehicle stops, shall not be less than 1.5 m/s2. The test shall be carried out with the laden vehicle. The force exerted on the braking control device shall not exceed the specified values.	*no requirement for dynamic performance*