Comptroller General of the General Accounting Office prior to publication of this rule in today's **Federal Register**. This is not a ''major rule'' as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR Parts 180 and 186

Environmental protection, Administrative practice and procedure, Agricultural commodities, Animal feeds, Pesticides and pests, Reporting and recordkeeping requirements.

Dated: August 25, 1997.

James Jones,

Acting Director, Registration Division, Office of Pesticide Programs.

Therefore, 40 CFR chapter I is amended as follows:

PART 180—[AMENDED]

1. The authority citation for part 180 continues to read as follows:

Authority: 21 U.S.C. 346a and 371.

2. Section 180.142 is amended as follows:

i. By adding a heading to paragraph (a), by redesignating paragraphs (a)(1) and (a)(2) as paragraphs (a)(1)(i) and (a)(1)(ii), respectively, by designating the introductory text of paragraph (a) as paragraph (a)(1), and by adding new paragraph (a)(12).

ii. By redesignating the introductory text of paragraph (b) as the introductory text of paragraph (a)(2), and paragraphs (b)(1), (b)(1)(i), (b)(1)(ii), and (b)(2) as paragraphs (a)(2)(i), (a)(2)(i)(A), (a)(2)(i)(B), and (a)(2)(ii), respectively.

iii. By redesignating paragraphs (c) through (k) as paragraphs (a)(3) through (a)(11), respectively.

iv. By adding a new paragraph (b).

v. By adding and reserving paragraphs (c) and (d) with headings.

§ 180.142 2,4-D; tolerances for residues.

(a) *General.* * * *

(12) The following tolerances are established for residues of 2,4-D (2,4-dichloro-phenoxyacetic acid) in the following processed feeds. Such residues may be present therein only as a result of application to the growing crop of the herbicides identified in this section:

(i) 5 parts per million in sugarcane bagasse and sugarcane molasses.

(ii) 2 parts per million in the milled fractions derived from barley, oats, rye, and wheat to be ingested as animal feed or converted into animal feed.

(b) *Section 18 emergency exemptions.* A time-limited tolerance is established for 2,4-dichlorophenoxyacetic acid (2,4-D) in or on wild rice in connection with use of the pesticide under a section 18 emergency exemption granted by EPA. The tolerance will expire on the dates specified in the following table.

Commodity	Parts per million	Expiration/Revocation Date
Wild rice	0.1 ppm	August 31, 1998

(c) *Tolerances with regional registrations.* [Reserved]

(d) *Indirect or inadvertent residues.* [Reserved]

2. In part 186:

a. The authority citation for part 186 continues to read as follows:

Authority: 21 U.S.C. 342, 348, and 701.

§ 186.1450 [Removed]

b. Section 186.1450 is removed.

[FR Doc. 97–23684 Filed 9–4–97; 8:45 am]
BILLING CODE 6560–50–F

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. 85–6; Notice 12]

RIN 2127–AG05

Federal Motor Vehicle Safety Standards; Hydraulic Brake Systems; Passenger Car Brake Systems

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of Transportation.

ACTION: Final rule.

SUMMARY: This document amends Federal Motor Vehicle Safety Standards Nos. 105 *Hydraulic Brake Systems* and 135 *Passenger Car Brake Systems* to accommodate the brake systems on electric vehicles. The amendments address unique characteristics of brake systems on electric vehicles, such as regenerative braking, and are intended to assure safe performance for those brake systems. The amendments of Standard No. 105 apply to electric trucks, buses, and multipurpose passenger vehicles. They also apply to electric passenger cars that have not availed themselves of the option of conforming to Standard No. 135, which is mandatory for all passenger cars manufactured on and after September 1, 2000. The amendments to Standard No. 135 complement those made to Standard No. 105.

DATES: The amendments to both standards are effective October 20, 1997. Compliance with Standard No. 105 is mandatory as of September 1, 1998.

Compliance with Standard No. 135 is mandatory as of September 1, 2000, the effective date of Standard No. 135. Petitions for reconsideration of the final rule must be submitted not later than October 20, 1997.

ADDRESS: Petitions for reconsideration should be addressed to Docket 85–6; Notice 12, and submitted to Docket Room, NHTSA, Room 5108, 400 Seventh St. SW, Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Samuel Daniel, Vehicle Dynamics Division, Office of Vehicle Safety Standards, NHTSA (Phone: 202–366–4921).

SUPPLEMENTARY INFORMATION:

Table of Contents

1. Background

On January 15, 1993, NHTSA published a Supplemental Notice of Proposed Rulemaking (SNPRM) concerning brake system performance of electric vehicles (EVs) (Docket No. 85–6; Notice 7, 58 FR 4649). Notice 7 proposed amendments to Standard No. 105, *Hydraulic Brake Systems* and revised portions of a proposed Standard No. 135, *Passenger Car Brake Systems.* Standard No. 135 was issued as a final rule (Notice 8, 60 FR 6411) on February 2, 1995, with an effective date of March 6, 1995. Passenger cars, including EVs, may comply with either Standard No. 105 or Standard No. 135, until September 1, 2000, after which Standard No. 135 will become the sole Federal motor vehicle safety standard for passenger car brakes. Standard No. 105, as amended in this notice, will continue to apply to electrically-powered multipurpose vehicles, trucks, and buses after September 1, 2000, although NHTSA has proposed (Notice 11) that Standard No. 135 be amended to apply, effective September 1, 2002, to multipurpose passenger vehicles, trucks, and buses with a GVWR of 10,000 pounds or less (61 FR 19602).

On September 26, 1995, the agency published a Further Supplemental Notice of Proposed Rulemaking (FSNPRM), Notice 10 (60 FR 49544). Notice 10 refined Notice 7's proposed amendments to Standard Nos. 105, *Hydraulic Brake Systems*, and No. 135, *Passenger Car Brake Systems.* For a detailed history of the development of Federal braking standards for EVs, the reader may consult Notice 7 and Notice 10.

Seven commenters, all motor vehicle manufacturers, responded to Notice 10. They were Toyota Motor Corporation, General Motors Corporation (GM), Chrysler Corporation, Ford Motor Company, Nissan North America, Hydro Quebec (HQ), and Honda. All supported the agency's rulemaking for EV brake systems. Notice 10 solicited specific comment on two general questions: (1) Whether 2 miles is sufficient distance for an EV to attain its maximum speed for compliance test purposes, and (2) whether any EV manufacturer plans to equip its vehicles with a braking system that includes a regenerative braking system (RBS) that does not include an anti-lock braking system (ABS). All seven commenters indicated that 2 miles was sufficient for an EV to obtain maximum speed under most conditions. None of the commenters indicated that they planned to produce EV brake systems that included RBS but excluded ABS.

The following were the specific issues raised by comments to Notice 10.

2. Issues Relating to Definitions

Notice 10 proposed revising the existing definitions of ''Backup system'' and ''Split service brake system'', and adding definitions for ''Electric vehicle or EV'', and ''Regenerative braking system or RBS.'' These would apply to both Standards Nos. 105 and 135. With the minor addition noted below for RBS, the four definitions have been adopted as proposed.

In addition, Notice 10 proposed a definition of ''Maximum speed or Vmax'' for Standard No. 135. Standard No. 135 now contains a definition of the term, thus, this Notice only adds language to the definition that is appropriate for EVs. With reference to RBS, HQ suggested that the term ''dynamic braking'' be adopted for purposes of Standards Nos. 105 and 135. Dynamic braking includes vehicle retardation that results from dissipation of electrical energy when the battery(s) is at a high state of charge as well as the retardation that occurs during battery recharging when the battery(s) state of charge is low. HQ suggested that the RBS definition proposed in Notice 10 be modified to include reference to the dissipation of the energy generated by the propulsion motors. The proposed definition stated that the energy produced by the propulsion motors in the regenerative mode is returned to the battery(s). Dissipation of the electrical energy developed through the RBS could develop braking forces that are not dependent on the state-of-charge of the batteries, according to HQ.

NHTSA agrees with HQ's observations that dissipation of the energy produced by RBS while the propulsion motor(s) are in the regenerative mode was not addressed in the proposed RBS definition. Since RBS control systems with the capability of dissipating energy generated by the RBS are under development, the agency believes that the definition of RBS should include a reference to this capability. Thus, NHTSA is amending the definition proposed in Notice 10 for regenerative braking system (RBS) in Standards Nos. 105 and 135 to state that it ''* * * means a system for recovering or dissipating kinetic energy. * * *'' However, the agency does not believe a definition for ''dynamic braking'' should be added to the braking standards. HQ did not indicate how it would be placed at a disadvantage without the new definition. The definition for dynamic braking recommended by HQ involves a combination of the energy dissipated and stored by the RBS control system. The agency feels that inclusion of the energy dissipation feature in the definition for RBS is sufficient to address HQ's comment.

Nissan commented on the lack of definition of electrically-actuated service brakes'', and asked that the agency adopt one to specify electrically-actuated service brake system components. Toyota recommended that the agency define the term as ''a braking system which converts the electric energy of the battery directly to the braking force.'' In its view, it is necessary to distinguish systems whose main braking power is electrical from those systems in which electric energy is used to operate power assist units such as vacuum and hydraulic pumps. Electrically-operated power assist units should not be considered electrically-actuated service brakes. Honda also asked for a clarification of the term.

Notice 10 uses the term ''electrically-actuated service brakes'' several times in the prospective regulatory text for Standards Nos. 105 and 135, and, as the commenters noted, without proposing a definition for it. One example of use of the term is in proposed paragraphs S5.1.3.5 and S7.11.3 of Standards Nos. 105 and 135 respectively, called *Electric brakes,* which specify partial failure performance requirements for vehicles with any single failure in the electrically-actuated service brakes.

NHTSA believes that Notice 10 contained an adequate explanation of electrically-actuated service brakes, brake power assist units, and electric or electronic transmission or service brake control. Electrically-driven brake power assist units, such as hydraulic pumps or vacuum motors that serve to reduce the driver-applied brake control force, are not electrically-actuated service brake components. Neither are systems in which the brake control signal is transmitted electrically or electronically from the brake control to the foundation brake (commonly known as electronic braking systems). The definition of ''electrically-actuated service brakes'' will read: ''Electrically-actuated service brakes means service brakes that utilize electrical energy to actuate the foundation brakes.''

HQ requested that the definition of ''antilock brake system'' (ABS) in Standards No. 105 and 135 be modified to indicate that ABS is a *capability* of the service brake system. ABS is defined

in the standards as *part* of the service brake system rather than a capability of the service brake system. HQ also suggested that the definition of ''ABS'' be changed by substituting the term ''braking'' for ''brake actuating'' because the latter implies the actuation of a foundation brake. According to HQ, the term ''braking'' would apply to any type of braking force modulation including braking forces generated by vehicle components other than the foundation brakes.

The agency does not concur with these suggested modifications to the definition for ''ABS''. It believes that the braking forces developed by an electric motor(s) in an EV are covered adequately in the definition of ''regenerative braking system.'' Also, most conventional braking systems need to have specific hardware added to accomplish the ABS function. The agency has concluded that the current definition of RBS adequately addresses the braking system design features described by HQ.

3. Partial Failure (Standard No. 105)

Notice 10 proposed adding partial failure provisions to Standard No. 105 in a new paragraph S5.1.2.3., that a vehicle ''shall be capable of stopping from 60 mph within the corresponding distance specified in Column IV of Table II when there is a single failure in an electric brake circuit, and with all other systems intact.'' This was supported and has been adopted.

In addition, new wording was proposed under the partial failure requirements to address failures of an RBS that is part of the service brake system, since the RBS is not a separate ''circuit'' of the service brake system. This, too, was supported and has been adopted.

4. Issues Relating to RBS

A. RBS as Part of the Service Brake System

Notice 10 proposed that RBS would be ''considered to be part of the service brake system if it is automatically activated by an application of the service brake control, if there is no means provided for the driver to disconnect or otherwise deactivate it, and if the vehicle has no 'neutral' transmission position.''

GM indicated that the existence of a neutral transmission position should not exclude RBS from being considered part of the service brake system, according to GM, because a neutral transmission position need not have any effect on the operation of an RBS. The ability of the driver to disengage the RBS should be the only factor that precludes an RBS from being considered part of the service brake system.

Toyota commented that to its knowledge, almost all EVs with RBS have a neutral transmission position, and that the ''no neutral transmission position'' criterion should be deleted from conditions required for an RBS to be considered part of the service brake system.

Honda believed that the conditions under which RBS is considered part of the service brake system should be modified to indicate that the vehicle transmission may have no electrical or mechanical neutral position. Honda is concerned that RBS may be designed such that any torque from it is canceled when the shift lever is placed in neutral, even though there is no mechanical disconnection between the drive train and the motor.

NHTSA agrees with GM and Toyota that the lack of a neutral transmission position need not be a condition for inclusion of RBS in the service brake system, and is deleting it from the final rule. A neutral transmission position need not have an effect on RBS because the neutral position does not require that the drive line be mechanically disconnected from the propulsion motor(s), as indicated by Honda.

Honda requested that a distinction be made between a neutral position that includes mechanical disconnection between the propulsion battery(s) and the drive line and one that does not. NHTSA does not believe that a definition for ''neutral'', as requested by Honda, is needed. However, Notice 10 proposed that including RBS in the service brake system requires that the selected position of the vehicle's transmission have no effect on the RBS function.

NHTSA believes that RBS should operate in the same manner and under the same conditions as the service brake system if it is to be included as part of the service brake system. For example, the service brake system is controlled by the service brake control only. If RBS is to be included in the service brake system, it should also be controlled by the service brake control only. Similarly, the service brake system is operational in all transmission positions (gears) and RBS should also be operational in all transmission gears, including neutral, if it is to be considered part of the service brake system.

In view of the comments to Notice 10, NHTSA is modifying the conditions under which RBS is considered part of the service brake system. Accordingly, the final rule amending Standards No. 105 (S6.2.4(a)) and No. 135 (S5.1.3(a)) states that ''the RBS is considered part of the service brake system if it is automatically activated by an application of the service brake control, if there is no means provided for the driver to disconnect or otherwise deactivate it, and it is activated in all transmission positions, including neutral.''

B. RBS Braking Effects

Nissan believes the retardation capacity of some electric propulsion motor(s) is insufficient to be characterized as braking. Nissan requests that only RBS that demonstrate braking effects greater than the transmission braking effects required in Standard No. 102, *Transmission shift lever sequence, starter interlock, and transmission braking effect,* be considered in Standards Nos. 105 and 135.

NHTSA does not believe RBS systems should be required to have at least a two speed transmission, as would be required if the transmission braking effects provisions of Standard No. 102 were added to the braking standards. It is practical for an EV to perform with a single gear ratio transmission. The agency believes that the Nissan request would limit EV design unnecessarily. Therefore, it is taking no action on this request.

C. ABS Control Over RBS

Proposed Paragraphs S5.5 of Standard No. 105 and S5.1.3 of Standard No. 135 state that ''* * * for an EV that is equipped with both ABS and RBS that is part of the service brake system, the ABS must control the RBS''.

Chrysler cautioned that EV technology is still new and manufacturers need more design flexibility in this area, and argued that it is inappropriate for the agency to require that RBS be controlled by ABS and that the agency should specify performance requirements.

The purpose of the proposed requirement is to assure that RBS is not operating while ABS is reducing the braking forces in the foundation brake system. The added braking torque of the RBS under this condition would be counter-productive and may cause vehicle instability. NHTSA believes that the requirement is necessary for RBS that is part of the service brake system since these systems cannot be controlled by the driver. The requirement is adopted as proposed.

5. Issues Relating to Failure Indicators

A. Red ''BRAKE'' Warning Lamp as Signal of RBS Failure

Notice 10 proposed new paragraphs in Standards No. 105 (S5.3.1) and No. 135 (S5.5.5) which would require that a red ''brake'' indicator lamp be illuminated under various conditions including the three following: ''(e) For a vehicle with electrically-actuated service brakes, failure of the source of power to the brakes, or diminution of the state of charge of the batteries to a level less than that specified by the manufacturer for the purpose of warning a driver of degraded brake performance, (f) For a vehicle with electric transmission of the service brake control signal, failure of the brake control circuit, and (g) For an EV with RBS that is part of the service brake system, failure of the RBS.''

GM commented that failure of the RBS in all known EV brake systems will not cause a significant reduction in overall braking performance. Therefore, failure of the RBS should not result in the illumination of a red telltale lamp since red telltales are used to indicate emergency situations in which the vehicle needs immediate service. An amber driver warning display such as the ABS telltale should be allowed in the standards as an option to indicate an RBS failure whether or not RBS is part of the service brake system.

According to Ford, failure of RBS will diminish an enhancement of the braking system but will not result in substantially reduced braking performance. The RBS on-board telltale need not be red, indicating the need for immediate service, but an amber lamp, such as the ABS warning indicator, should be an option.

According to GM and Ford, the foundation brake system on their EV models is capable of meeting all braking performance requirements without contribution from the RBS. As a result, GM and Ford believe that a failure of the RBS system should not require the illumination of a red ''Brake'' indicator.

Honda believes that manufacturers should be allowed to use an amber indicator lamp instead of a red lamp when a failure occurs in the brake control circuit of a vehicle with electric transmission of the service brake control signal provided that the total braking force is not impaired by the failure. It, too, agrees that, in the event of RBS failure or failure of the electrical circuitry that controls the hydraulic brake force, all braking would be done by the hydraulic system with no loss of performance.

Honda further states that Standards Nos. 105 and 135 do not require illumination of a red brake warning lamp when a brake power unit, power assist unit, or an ABS failure occurs.

In Notice 10, the agency retained the proposed requirement for illumination of an on-board, red ''Brake'' lamp to indicate failure of these systems. Notice 10 proposed that the requirement for a red brake lamp for RBS failures be limited to cases in which RBS is part of the service brake system. This was a modification of Notice 7, which required that failure of RBS systems that are part of the service brake system and those that are not, be indicated by a red on-board brake lamp.

The arguments made by commenters to Notice 10 stating that braking performance is not substantially diminished by a failure of the RBS are convincing. If RBS is part of the service brake system, it is active at all times and is controlled by application of the service brake only. The contribution of RBS to overall vehicle braking may be substantial at times and this contribution is dependent on many factors including the state of charge of the propulsion battery(s). NHTSA agrees with the commenters that a failure of RBS will not affect the ability of the foundation brakes to provide adequate brake performance under most conditions. The agency also agrees with commenters that the loss of the RBS braking contribution will not result in a safety hazard in an emergency stop situation. The agency accepts the request by GM, Ford and Honda to allow an optional amber (yellow) lamp to warn drivers of a failed RBS system. NHTSA believes that illumination of the red ''brake'' warning signal would signify the need for immediate remedial action by the driver, which is not warranted. The ''service soon'' message that is conveyed by an amber on-board telltale is sufficient warning in the case of a failed RBS system that is part of the service brake system.

NHTSA has not granted Honda's request that an amber lamp be allowed which would indicate a failure in the electric brake control circuitry of a brake system in which the brake control signal is transmitted electrically from the service brake control to the foundation brakes (paragraph S5.3.1(f) of Standard No. 105, and paragraph S5.5.1(f) of Standard No. 135). The final rule allows the option of illuminating an amber on-board lamp in the event of an RBS failure for cases in which the RBS is part of the service brake system. However, an amber indicator lamp will not be allowed as an option to replace a red indicator to signal failure of the control circuit for vehicles with electric transmission of the brake control signal. See the amended text in the discussion under the heading that follows.

B. Common ABS/RBS Malfunction Indicator

Ford requests that the option be provided to group the RBS and ABS malfunction modes with a common warning indicator because the two systems share many of the same software and hardware components.

NHTSA agrees that a common ABS/RBS malfunction warning indicator should be allowed for cases in which the RBS is part of the service brake system. In these cases, ABS and RBS are required to communicate (see proposed paragraph S5.5 of Standard No. 105) and are likely to share many components, as indicated by Ford. Accordingly, paragraph S5.3.1(g) of Standard No. 105, and paragraph S5.5.1(g) of Standard No. 135 are adopted to require an indicator to indicate failure of the RBS and optional illumination under other circumstances: ''(g) For an EV with RBS that is part of the service brake system, failure of the RBS. An amber lamp may be used displaying the symbol 'RBS'. RBS failure in a system that is part of the service brake system may also be indicated by an amber lamp that also indicates ABS failure and displays the symbol 'ABS/RBS'''.

6. Issues Related to Compliance Testing

A. Procedure for Determining Battery State of Charge

NHTSA proposed that the state of charge of the propulsion batteries be determined in accordance with SAE J227a *Electric Vehicle Test Procedure,* February 1976 (S6.2.1 of FMVSS No. 105, S6.3.11.1 of Standard No. 135), specifically that the applicable sections of J227a are 3.2.1 through 3.2.4, 3.3.1 through 3.3.2.2, 3.4.1 and 3.4.2, 4.2.1, 5.2, 5.2.1, and 5.3. There were no comments on this issue and the proposal has been adopted.

B. Procedure for Recharging Batteries During Burnish

The burnish procedures (S7.4 of Standard No. 105 and S7.1 of Standard No. 135) result in a maximum distance between each of the burnish stops of 1.24 miles. The continuous acceleration and deceleration of a burnish procedure could result in fairly extensive battery depletion after approximately 40 stops. Therefore, NHTSA proposed that the propulsion batteries be recharged after each increment of 40 burnish stops until each burnish procedure is complete (S6.2.2 of Standard No. 105 and

S6.3.11.2 of Standard No. 135). Charging at a more frequent interval would be permitted if the vehicle were incapable of achieving the initial burnish test speed during a 40-stop sequence. In addition, the manufacturer would be permitted the option of recharging by external means or by substituting other propulsion batteries at 95 per cent or greater charge. This proposal was supported by the commenters, and is adopted in the final rule. Notice 10 also proposed that, if an EV has a manual control for setting the level of regenerative braking, at the beginning of each burnish procedure the control would be set to provide maximum regenerative braking throughout each burnish. There were no comments on this proposal, and it is adopted.

In GM's view, the brake burnishing procedures proposed for S6.2.2 of Standard No. 105 are not clear with respect to the propulsion battery state of charge at the beginning of the tests. GM recommended that the final rule be consistent with the burnish procedures adopted for Standard No. 135. GM is correct, and paragraph S6.2.2 as adopted specifies that the state of charge of the propulsion battery(s) at the beginning of each burnish procedure is not less than 95 percent of full charge. This modification is also consistent with the burnishing requirements and procedures adopted in Standard No. 135.

C. Procedure for Charging Batteries

Notice 10 proposed that each burnish procedure and each braking test procedure be initiated with the EV's propulsion batteries at a state of charge of not less than 95 percent. Paragraphs S6.2.2 and S6.2.3 of Standard No. 105 and paragraph S6.3.11 of Standard No. 135 read in part as follows: ''At the beginning of each performance test in the test sequence (S7.3, S7.5, S7.7 through S7.11, and S7.14 through S7.19 of this standard), unless otherwise specified, an EV's propulsion battery(s) are at a state or charge of not less than 95 percent (the batteries may be charged by external means or replaced by batteries that are at a state of charge of not less than 95 percent)''.

GM commented that the phrase ''or fully charged per the manufacturer's recommended procedure'' should be added to the specifications for charging EV batteries. In its view, adding the phrase will avoid potential conflicts and ambiguities for cases in which the EV charging system is not designed to charge the battery(s) to 95 percent of capacity. According to GM, extreme high and low states of charge should be avoided to maximize battery life expectancy. GM believes the manufacturer's recommended procedure for charging batteries may be especially important for hybrid vehicles with on-board chargers since these battery(s) may be designed to operate in a narrow state of charge range.

Chrysler stated that all its EVs are equipped with an on-board battery management system that controls battery charging, discharging, and overall performance. The EV brake testing requirements in the final rule should specify that the manufacturer's recommended energy charging and measuring procedures be utilized, if available.

NHTSA agrees that the manufacturer's procedures should be used for charging the propulsion batteries for performance tests as well as burnishing if such procedures are available.

The agency is changing the amendments proposed in Notice 10 requiring that battery(s) be at a state of charge of not less than 95 percent at the beginning of each test procedure. The state of charge requirement is being expanded to allow the battery(s) to be charged in accordance with procedures recommended by the vehicle manufacturer. If a battery charging procedure or a state of charge measurement procedure is permanently attached to the vehicle or published in the vehicle operator's manual, the procedure will be utilized during brake testing. If the manufacturer does not provide a procedure for charging the propulsion battery(s), the procedure proposed in Notice 10 will be utilized. Therefore, NHTSA is adopting paragraphs S6.2.2 and S6.2.3 of Standard No. 105 and paragraph S6.3.11 of Standard No. 135 to read in pertinent part as follows: ''* * * an EV's propulsion battery(s) are at the maximum state of charge recommended by the manufacturer, as stated in the vehicle operator's manual or on a label that is permanently attached to the vehicle, or, if the manufacturer has made no recommendation, at a state of charge of not less than 95 percent. If battery(s) are replaced rather than re-charged, the replacement battery(s) are charged and measured for state of charge in accordance with these procedures.''

Chrysler is concerned that proposed paragraph S6.2.3 of Standard No. 105 does not allow for charging during the test sequences listed and that EVs may not be able to complete the tests without recharging.

Notice 10 did not propose procedures for re-charging during the test sequences because NHTSA did not believe that such re-charging would be necessary. However, the agency now realizes that the propulsion battery(s) may be depleted such that the vehicle automatically shuts-down, reaches a point at which it will not accelerate, or the low state of charge lamp is illuminated (Standard No. 105, proposed paragraph S5.3.1). If any of these conditions occur, during a test sequence, the final rule permits the vehicle to be accelerated to brake test speed by auxiliary means since some tests are required to be conducted within a time limit that would preclude re-charging or replacing the battery(s) with one that is fully charged. Accordingly, paragraph S6.2.3 of Standard No. 105 and paragraph S6.3.11.3 of Standard No. 135, as adopted, clarify this. Each states that ''* * * No further charging of the propulsion batteries occurs during any of the performance tests in the test sequence of this standard. If the propulsion batteries are depleted during a test sequence such that the vehicle reaches automatic shut-down, will not accelerate, or the low state of charge brake warning lamp is illuminated, the vehicle is to be accelerated to brake test speed by auxiliary means until the test sequence is completed.''

By adopting this test condition, NHTSA intends that the batteries be essentially at full charge at the beginning of each test sequence.

D. Testing in Gear as Opposed to Testing in Neutral

This issue involves testing EVs in which RBS is not part of the service brake system. For such vehicles, Notice 10 proposed to amend Standards Nos. 105 (S6.2.4(b)) and No. 135,(S6.3.13) to state that ''the RBS is operational and set to produce the maximum regenerative braking effect during the burnish tests, and is disabled during the test procedures.''

GM commented that the requirement that a RBS that is not part of the service brake system be disabled for all tests other than burnishing tests is in conflict with other test procedures. Some of the test procedures in both Standards Nos. 105 and 135 require that the vehicle be tested with the transmission in gear. If an EV has a RBS that is not part of the service brake system and the RBS is designed to operate when the transmission is in gear, the RBS would have to be disconnected for the in-gear test procedures. GM recommends that the standards state that the RBS need not be disabled for in-gear braking if the RBS can be disabled only through ''tampering'' when the transmission is in gear. GM notes that the number of tests affected is relatively small and the

high state of charge required at the beginning of these tests will result in a low level of regenerative braking.

Chrysler remarked that when internal combustion engine (ICE) vehicles are tested in gear, they take advantage of the braking effects of the engine and transmission. Chrysler believes that EVs should be allowed to use their RBS for in-gear testing since it is analogous to the engine and transmission braking effects in ICE vehicles.

In Nissan's opinion, RBS should be allowed to be operational during the in-gear brake testing procedures, whether or not the RBS is part of the service brake system.

Toyota believes that the heating snub test, proposed paragraph S7.13 of Standard No. 135, should be conducted in the ''in-gear'' mode, to be consistent with the burnishing tests and to conform with ICE vehicle testing.

Finally, Honda commented that, since the proposed test conditions in both standards require that the drive line be engaged during the braking procedures, the ''in gear'' testing specification should be changed to allow the option of testing in neutral for vehicles with RBS that is activated when the transmission is in gear.

NHTSA agrees with GM that a requirement to conduct certain tests in gear with the RBS disconnected would conflict with the design of many EVs. For these designs, the RBS is activated when the vehicle is in gear and deactivated in the neutral transmission position. For EVs in which the RBS is not part of the service brake system, meeting the proposed test conditions would, as previously written, require ''tampering'' with the RBS to disengage it while the vehicle is in gear. If the RBS is disengaged when the transmission is in the neutral position, these tests can be conducted in neutral, as suggested by Honda. The agency disagrees with the GM statement that most of the test procedures are conducted in neutral. While this is true for Standard No. 135, there are a significant number of in-gear test procedures in Standard No. 105.

NHTSA agrees with Chrysler that the RBS functions in much the same manner in EVs as does the engine and transmission braking effect in ICE vehicles. If the RBS is active, it provides vehicle deceleration forces in a manner similar to the engine and transmission for an ICE vehicle. However, if the RBS is not part of the service brake system, its use is optional in most cases. There is no assurance when the RBS is not part of the service brake system that it will be engaged or activated by the driver at any given time. This is the primary reason Notice 10 proposed that the test procedures be conducted with the RBS non-functional if the RBS is not part of the service brake system.

NHTSA also disagrees with Toyota's recommendation that the heating snub test in proposed paragraph S7.13 of Standard No. 135 be conducted with the RBS engaged. The same reasoning applies in the case of heating snubs, that is, if the RBS is not part of the service brake system, its use will be optional in most cases, and there is no assurance when the RBS is not part of the service brake system that it will be engaged or activated by the driver at any given time.

NHTSA has decided that the requirements proposed in Notice 10 for vehicles in which the RBS is not part of the service brake system need to be modified to address in-gear testing. Thus, the final rule requires that manufacturers render RBS inoperative, including placing the transmission in the neutral position if the RBS is deactivated in neutral, during testing under conditions that would otherwise require the vehicle to be in gear.

Accordingly, paragraph S6.2.4(b) of Standard No. 105 and paragraph S6.3.13 of Standard No. 135 are adopted to read as follows: ''For an EV equipped with an RBS that is not part of the service brake system, the RBS is operational and set to produce the maximum regenerative braking effect during the burnish tests, and is disabled during the test procedures. If the vehicle is equipped with a neutral position that automatically disables the RBS, the test procedures which are designated to be conducted in gear may be conducted in neutral.''

E. Testing at Low State of Charge

(i) *Low state of charge measurement.* With respect to state of charge of the propulsion batteries, paragraph S6.2.6 proposed in Notice 10 in part that: ''A vehicle equipped with electrically-actuated service brakes also performs the tests specified in S7.3, S7.5, S7.7 through S7.11, and S7.13 through S7.19 of this standard with the batteries providing power to those electrically-actuated brakes, at the beginning of each test, in a depleted state of charge for condition (a), (b), or (c) of this paragraph as appropriate.'' Proposed paragraph S6.3.12 of Standard No. 135 was similar. Paragraphs S6.2.6(a) and S6.2.6(b) of Standard No. 105 would require that propulsion battery(s) used to power electrically-actuated service brakes be at a state of charge that is not more than two percent and not less than one percent above the state of charge that would shut down the propulsion system or activate the brake failure warning lamp. Paragraph S6.2.6(c) of Standard No. 105 would require that auxiliary battery(s) that are used to power electrically-actuated service brakes be at a state of charge that is not more than two percent and not less than one percent above the state of charge that would activate the brake failure warning lamp.

Toyota, GM, and Nissan commented on the conditions and procedures proposed in Notice 10 for paragraphs S6.2.6 (a) and (b) of Standard No. 105 in which the propulsion battery(s) are used to power electrically-actuated service brakes. These commenters recommended that the test conditions be modified to reduce the burden of the state of charge measurement technique. The commenters argued that, with current technology, it would be extremely difficult for many test facilities to measure the state of charge with one or two percent accuracy. These commenters recommended that the agency adopt a five percent initial battery(s) state of charge for testing under S6.2.6 of Standard No. 105 and S6.3.12 of Standard No. 135.

Based on these comments, NHTSA believes that the one to two percent state of charge range proposed as the initial test condition for the propulsion and auxiliary battery(s) used in low state of charge tests would be difficult to measure. A five percent state of charge would not appreciably change the stringency of the requirements, but would substantially reduce the state of charge measurement burden.

For these reasons, Standard No. 135 (S6.3.12(c)), as adopted, will state that ''* * * the auxiliary battery(s) is at not more than five percent above the actual state of charge at which the brake failure warning signal, required by S5.5.1(e) of this standard, is illuminated.'' The propulsion battery(s) referenced in S6.3.12 (a) and (b) of Standard No. 135 will also be charged to not more than five percent above the state of charge that would cause shut down or illumination of the brake failure warning lamp. The auxiliary battery(s) in paragraph S6.2.6(c) of Standard No. 105, and the propulsion battery(s) in paragraphs S6.2.6 (a), and (b), will be charged to not more than five percent above the state of charge that would illuminate the brake system indicator lamp as required in S5.3.1(e), or the state of charge that would result in automatic shut-down of the propulsion system.

(ii) *Low State of charge testing.* The agency proposed in Notice 10 that EVs with electrically actuated service brakes be required to complete a series of brake performance tests with the battery(s) at

a low state of charge. With respect to the state of charge of propulsion batteries, paragraph S6.2.6 of Standard No. 105 proposed in part that: ''A vehicle equipped with electrically-actuated service brakes also performs the tests specified in S7.3, S7.5, S7.7, through S7.11, and S7.13 through S7.19 of this standard with the battery(s) providing power to those electrically-actuated brakes, at the beginning of each test, in a depleted state of charge for condition (a), (b), or (c) of this paragraph as appropriate.'' To the same effect was proposed paragraph S6.3.12 of Standard No. 135.

The agency argued that a vehicle that can be operated should be able to perform a full series of brake tests. The agency further stated that the purpose of the test series is to assure that a vehicle will operate properly if any one of the test conditions occur during operation.

GM, in its comments to Notice 10, continued to express the concern it expressed in response to Notice 7. That is, the requirement for a full series of tests under depleted battery(s) conditions is unreasonable and unnecessary. All commenters responding to Notice 7 indicated that it was unreasonable and unnecessary to subject an EV to a complete brake test series with depleted battery(s). They indicated that a vehicle with a low state of charge in the propulsion battery(s) could be expected to perform a low number of accelerations prior to becoming immobile. The commenters argued that it was unreasonable to require braking capacity that far exceeds propulsion capacity.

After further consideration, the agency agrees that a full series of tests is not necessary because it is very unlikely that a vehicle with a low state of charge would require the braking capacity needed to perform an entire brake test series under either Standard No. 105 or Standard No. 135. NHTSA also believes that current propulsion battery(s) would need substantial redesign to comply with the proposed requirements.

GM requested that the agency reconsider the procedure for a dedicated low charge braking test that the company had recommended in its comments to Notice 7.

The agency feels that an abbreviated braking test procedure similar to the one recommended by GM in its comments to Notice 7 is appropriate, and that it is sufficient for an EV with electrically-actuated service brakes to demonstrate braking power while it can still be accelerated.

GM also indicated that the recharging procedures for these tests needed clarification. The proposed test procedure for low battery(s) state of charge testing specified in Notice 10 does not allow for recharging, but states that a vehicle may be accelerated to test speed by auxiliary means. The test procedures adopted in the final rule do not allow for recharging of the battery(s) that provide power for electrically-actuated service brakes. An auxiliary means is to be provided as necessary to accelerate the vehicle to test speed, as proposed in Notice 10.

The agency is specifying that an abbreviated low state of charge braking performance test series be conducted on EVs utilizing electrically-actuated service brakes. In addition, S6.2.6 of Standard No. 105 and S6.3.12 of Standard No. 135 are adopted to read: ''A vehicle equipped with electrically-actuated service brakes also performs the following test series. Conduct 10 stopping tests from a speed of 100 kph or the maximum vehicle speed, whichever is less. At least two of the 10 stopping distances must be less than or equal to 70 meters. The vehicle is to be loaded to GVWR for these tests and the transmission shall be in the neutral position when the service brake control is actuated and throughout the remainder of the test. The battery(s) providing power to those electrically-actuated service brakes, at the beginning of each test, shall be in a depleted state of charge for conditions (a), (b), or (c) of this paragraph as appropriate. An auxiliary means may be used to accelerate an EV to test speed.''

Nissan believed that it is not technically feasible to detect state of charge of an auxiliary battery and recommends that the agency delete the low state of charge performance tests for vehicles with auxiliary batteries that provide power for vacuum boosters and hydraulic pumps (electrically-actuated brakes).

Nissan believes that actual fluid pressure or vacuum should be monitored instead of the state of charge of an auxiliary battery in vehicles which have electrically-actuated service brakes. Notice 10 did not propose that auxiliary battery(s) that are used to power hydraulic pumps or vacuum motors be monitored for state of charge. The proposed requirement applies to auxiliary battery(s) that power electrically-actuated service brakes, brakes in which the brake control signal is electrically transmitted from the brake control unit to the foundation brakes, and RBS that is part of the service brake system. Auxiliary battery(s) that power hydraulic pumps and vacuum motors are not included under the proposed requirement for state of charge monitoring. No action is taken in response to this comment.

7. Issues Related to Test Conditions

A. Initial Brake Temperature (IBT)

HQ believes that its braking system will not achieve the IBT required in section S7 *Road test procedures and performance requirements* of Standard No. 135 for the foundation or friction brakes when the heating tests are conducted because a large percentage of the braking forces are supplied by dynamic (dissipative) braking. HQ suggests that the IBT condition be made optional for EVs as well as the test sequence S7.13–S7.16 because the HQ dynamic braking system will develop low temperatures in the friction brake system components.

NHTSA agrees that the dynamic braking forces (RBS-type) of the HQ braking system could result in low brake temperatures for the foundation friction brakes. Neither Standard No. 105 nor Standard No. 135 specify procedures for establishing the IBT for those test procedures that require an initial brake temperature. The agency believes that the IBT condition can be met if several stops are performed with the RBS disabled or disengaged, and that disabling or disengaging the RBS system would not be impracticable. The agency also believes that the hot performance and recovery performance tests in paragraphs S7.13 through S7.16 of Standard No. 135 are an extremely important phase of the overall brake testing and that all vehicles with friction brakes should perform these tests. Thus, it has made no modifications in adopting the IBT condition as proposed.

B. Static Parking Brake Test

Proposed S7.7.1.3 in Standard No. 105 and S7.12.2(o) in Standard No. 135 would add language to clarify the means for activating electric parking brakes, to state ''[f]or vehicles with electrically activated parking brakes, apply the parking brakes by activating the parking brake control.'' NHTSA has adopted the proposed change.

C. Stops With Engine Off (Standard No. 135)

HQ believes that the vehicle engine off condition for brake testing (S7.7.2(a)) represents engine stalling for internal combustion engine vehicles and has no direct equivalent for EVs. However, the specification that the test is conducted with ''no electromotive force'' applied to the motor(s) proposed in paragraph S7.7.3(h) of Standard No. 135 is intended to serve the same purpose for

EVs as testing ICE vehicles with the engine off.

Nevertheless, HQ believes that the term needs further explanation since it is not clear whether regenerative braking using the electric motor(s) is allowed under S7.7.3(h). The proposed conditions of S7.7.3(h) for EVs during tests that are analogous to ICE vehicle tests with the engine off specify that the electric propulsion motor(s) not be supplied with any electromotive force, or be switched-off. The RBS is not allowed to operate under these test conditions. No amendment of the proposal is required, and S7.7.3(h) is adopted as proposed.

8. International Harmonization

The European Community has not finalized braking standards for EVs to date, and the conditions and procedures for EV testing specified in this final rule may be adopted by the Europeans.

NHTSA has been recently provided a current copy of draft Regulation 13–H (R13–H), the European version of the harmonized brake standard for light passenger vehicles. The draft was reviewed with respect to EV braking conditions and requirements to determine if they are compatible with the EV brake test conditions and requirements in this final rule. In general, EV brake system design and performance requirements in Standard No. 135 and R13–H are similar. For example, both rules account for RBS and both rules distinguish RBS that is part of the service brake system from RBS that is not. At this time, NHTSA does not anticipate that harmonization of the brake standards will be more difficult for EVs than for conventional vehicles.

In general, R13–H has specified more EV test procedures and conditions than the agency has specified in Standard No. 135 as amended by this final rule since the Europeans have more EV experience at this time. The R–13H draft does not, however, address EV recharging during testing or electrically-actuated service brakes for passenger cars. As NHTSA's experience increases, it may propose adding specific EV test procedures and conditions to the adhesion utilization requirements and other areas of performance.

Whatever future actions NHTSA takes in this area, it will discuss requirements for EV brake systems with braking experts from other nations. It should be possible for all regulatory authorities to reach a consistent harmonized approach when dealing with an emerging technology like EV brake systems.

The reader will find that provisions of this final rule not discussed by this notice are substantially the same as those proposed by Notice 10.

Effective Dates (Lead Time)

Notice 10 proposed that EV amendments to Standards Nos. 105 and 135 become effective 30 days after publication of the final rule.

Chrysler and Ford stated that one year after publication of the final rule would be preferable; if the standard is further amended, more lead time may be required for compliance to make necessary design modifications. However, an early effective date was supported by GM which wishes to certify its EV–1 passenger car to electric vehicle braking requirements at the earliest possible date.

NHTSA believes that the final rule is written in such a manner as to accommodate most present EV brake system designs without extensive modifications. But it is sensitive to the comments by Ford and Chrysler that each may need up to one year for leadtime, should they deem it necessary to modify their current EV braking system designs to meet the standards promulgated by this document.

To accommodate all commenters on this issue, NHTSA is adopting an early effective date for the electric brake amendments with mandatory compliance after one year. The amendments to Standard No. 105, which do not change the present requirements relating to hydraulic brake systems, will become effective 45 days after their publication. However, manufacturers of passenger cars, multipurpose passenger vehicles, trucks, and buses, with electric brake systems, need not comply until September 1, 1998. Manufacturers of passenger cars with hydraulic brake systems already have the option of meeting Standard No. 105 until September 1, 2000, and this same option is being afforded passenger cars with electric brake systems, under companion amendments to both Standards Nos. 105 and 135. To accomplish this, Section S3 Application of Standard No. 105 is being amended to read as follows:

''S3 *Application*

(a) This standard applies to the following vehicles with hydraulic or electric brake systems: multipurpose passenger vehicles, trucks, and buses, and to passenger cars manufactured before September 1, 2000.

(b) This standard, at the option of a manufacturer of a passenger car, multipurpose passenger vehicle, truck, or bus, with an electric brake system, does not apply before September 1, 1998.

(c) At the option of the manufacturer, passenger cars with hydraulic or electric brake systems manufactured before September 1, 2000, may comply with the requirements of Federal Motor Vehicle Safety Standard No. 135, Passenger Car Brake Systems, instead of the requirements of this standard.''

Compliance with Standard No. 135 is not mandatory until September 1, 2000, although manufacturers of passenger cars with hydraulic brake systems have the present option of complying with it as an alternative to Standard No. 105. The amendments made by this document do not affect the hydraulic brake requirements, but add requirements applicable to electric vehicle brakes and are incorporated into it effective 45 days after publication. The application section of Standard No. 135 is being amended to read:

''S3 *Application.* This standard applies to passenger cars manufactured on or after September 1, 2000. In addition, passenger cars manufactured before September 1, 2000 may, at the option of the manufacturer, meet the requirements of this standard instead of Federal Motor Vehicle Safety Standard No. 105 *Hydraulic and Electric Brake Systems.*''

In summary, passenger cars, multipurpose passenger vehicles, trucks, and buses, with electric brake systems need not comply with Standard No. 105 until September 1, 1998, and may comply before then. But all these vehicles must comply with Standard No. 105 on and after September 1, 1998. Alternatively, passenger cars with electric brake systems may comply with Standard No. 135 at any time before September 1, 2000, but otherwise must meet Standard No. 105 as of September 1, 1998, and Standard No. 135 as of September 1, 2000.

Because of the wish of some manufacturers to offer and certify complying vehicles with electric brake systems at an early date, and because the amendments do not affect existing requirements for vehicles with hydraulic brake systems, it is hereby found that an effective date earlier than 180 days after issuance of the amendments is in the public interest. Accordingly, the amendments are effective October 20, 1997.

Regulatory Analysis

Executive Order 12866 (Regulatory Planning and Review) and DOT Regulatory Policies and Procedures

This rulemaking has not been reviewed under Executive Order 12866. NHTSA has considered the economic implications of this regulation and determined that it is not significant within the meaning of the DOT

Regulatory Policies and Procedure. It does not initiate a substantial regulatory program or involve a change in policy.

Regulatory Flexibility Act

The agency has also considered the effects of this rulemaking action in relation to the Regulatory Flexibility Act. I certify that this rulemaking action will not have a significant economic effect upon a substantial number of small entities. Motor vehicle manufacturers are generally not small businesses within the meaning of the Regulatory Flexibility Act. Accordingly, no Regulatory Flexibility Analysis has been prepared.

Executive Order 12612 (Federalism)

This action has been analyzed in accordance with the principles and criteria contained in Executive Order 12612 on ''Federalism.'' It has been determined that the rulemaking action does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

National Environmental Policy Act

NHTSA has analyzed this rulemaking action for purposes of the National Environmental Policy Act. The rulemaking action will not have a significant effect upon the environment. There is no environmental impact associated with adaptation of test procedures to make them more appropriate for vehicles already required to comply with the Federal motor vehicle safety standards. The rulemaking action would not have a direct effect. However, to the extent that this rulemaking might facilitate the introduction of EVs which are powered by an electric motor drawing current from rechargeable storage batteries, fuel cells, or other portable sources of electric current, and which may include a nonelectrical source of power designed to charge batteries and components thereof, the rulemaking would have a beneficial effect upon the environment and reduce fuel consumption because EVs emit no hydrocarbon emissions and do not depend directly upon fossil fuels to propel them.

Executive Order 12778 (Civil Justice Reform)

This rule will not have any retroactive effect. Under 49 U.S.C. 30103, whenever a Federal motor vehicle safety standard is in effect, a state may not adopt or maintain a safety standard applicable to the same aspect of performance which is not identical to the Federal standard. Section 30161 of Title 49 sets forth a procedure for judicial review of final rules establishing, amending or revoking Federal motor vehicle safety standards. That section does not require submission of a petition for reconsideration or other administrative proceedings before parties may file suit in court.

List of Subjects in 49 CFR Part 571

Imports, Motor vehicle safety, Motor vehicles

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

In consideration of the foregoing, 49 CFR part 571 is amended as follows:

1. The authority citation for Part 571 continues to read as follows:

Authority: 49 U.S.C. 322, 30111, 30115, 30117, 30166; delegation of authority at 49 CFR 1.50.

§ 571.105 [Amended]

2. Section 571.105 is amended by:

a. Revising its heading;

b. Revising S1, S3, the definitions of ''backup system'' and ''split service brake system'' in S4 and adding to S4, in alphabetical order, definitions of ''Electric vehicle *or* EV'', ''Electrically-actuated service brakes'', and ''Regenerative braking system *or* RBS'';

c. Amending S5.1.1.4 to add a sentence at the end thereof below the undesignated table;

d. Adding S5.1.2.3, S5.1.2.4, and S5.1.3.5;

e . Revising the introductory text of S5.3.1 and adding S5.3.1 (e), (f), and (g);

f. Revising the introductory text of S5.3.5(c)(1) and S5.4.3;

g. Withdrawing the revision of S5.5 and additions of S5.5.1 and S5.5.2 published at 60 FR 13256, Mar. 10, 1995, and the revision of S5.5.1 published at 60 FR 63979, Dec. 13, 1995 that were to become effective March 1, 1999, and revising S5.5 as currently in effect and adding S5.5.1 and S5.5.2;

h. Adding S6.2 through S6.2.6;

i. Revising the introductory text of S7.7.1.3 and adding S7.7.1.3(c);

j. Adding S7.9.5 and S7.9.6; and

k. Adding S7.10.3

The revised and added heading and paragraphs read as follows:

§ 571.105 Standard No. 105; Hydraulic and electric brake systems.

S1. *Scope.* This standard specifies requirements for hydraulic and electric service brake systems, and associated parking brake systems.

* * * * *

S3. *Application.*

(a) This standard applies to the following vehicles with hydraulic or electric brake systems: multipurpose passenger vehicles, trucks, and buses, and to passenger cars manufactured before September 1, 2000.

(b) This standard, at the option of a manufacturer of a passenger car, multipurpose passenger vehicle, truck, or bus, with an electric brake system, does not apply before September 1, 1998.

(c) At the option of the manufacturer, passenger cars with hydraulic or electric brake systems manufactured before September 1, 2000, may comply with the requirements of Federal Motor Vehicle Safety Standard No. 135, *Passenger Car Brake Systems,* instead of the requirements of this standard.

S4. *Definitions.*

* * * * *

Backup system means a portion of a service brake system, such as a pump, that automatically supplies energy, in the event of a primary brake power source failure.

* * * * *

Electric vehicle or *EV* means a motor vehicle that is powered by an electric motor drawing current from rechargeable storage batteries, fuel cells, or other portable sources of electrical current, and which may include a non-electrical source of power designed to charge batteries and components thereof.

Electrically-actuated service brakes means service brakes that utilize electrical energy to actuate the foundation brakes.

* * * * *

Regenerative braking system or *RBS* means an electrical energy system that is installed in an EV for recovering or dissipating kinetic energy, and which uses the propulsion motor(s) as a retarder for partial braking of the EV while returning electrical energy to the propulsion batteries or dissipating electrical energy.

* * * * *

Split service brake system means a brake system consisting of two or more subsystems actuated by a single control, designed so that a single failure in any subsystem (such as a leakage-type failure of a pressure component of a hydraulic subsystem except structural failure of a housing that is common to two or more subsystems, or an electrical failure in an electric subsystem) does not impair the operation of any other subsystem.

* * * * *

S5.1.1.4 * * * For an EV, the speed attainable in 2 miles is determined with the propulsion batteries at a state of charge of not less than 95 percent at the beginning of the run.

S5.1.2 *Partial failure.*

* * * * *

S5.1.2.3 For a vehicle manufactured with a service brake system in which the brake signal is transmitted electrically between the brake pedal and some or all of the foundation brakes, regardless of the means of actuation of the foundation brakes, the vehicle shall be capable of stopping from 60 mph within the corresponding distance specified in Column IV of Table II with any single failure in any circuit that electrically transmits the brake signal, and with all other systems intact.

S5.1.2.4 For an EV manufactured with a service brake system that incorporates RBS, the vehicle shall be capable of stopping from 60 mph within the corresponding distance specified in Column IV of Table II with any single failure in the RBS, and with all other systems intact.

* * * * *

S5.1.3.5 *Electric brakes.* Each vehicle with electrically-actuated service brakes (brake power unit) shall comply with the requirements of S5.1.3.1 with any single electrical failure in the electrically-actuated service brakes and all other systems intact.

* * * * *

S5.3 *Brake system indicator lamp.*

* * *

S5.3.1 An indicator lamp shall be activated when the ignition (start) switch is in the ''on'' (''run'') position and whenever any of the conditions (a) or (b), (c), (d), (e), (f), and (g) occur:

* * * * *

(e) For a vehicle with electrically-actuated service brakes, failure of the source of electric power to the brakes, or diminution of state of charge of the batteries to less than a level specified by the manufacturer for the purpose of warning a driver of degraded brake performance.

(f) For a vehicle with electric transmission of the service brake control signal, failure of a brake control circuit.

(g) For an EV with RBS that is part of the service brake system, failure of the RBS. An amber lamp may be used displaying the symbol ''RBS.'' RBS failure in a system that is part of the service brake system may also be indicated by an amber lamp that also indicates ABS failure and displays the symbol ''ABS/RBS''.

* * * * *

S5.3.5 * * *

(c)(1) If separate indicators are used for one or more of the conditions described in S5.3.1(a) through S5.3.1(g) of this standard, the indicator display shall include the word ''Brake'' and appropriate additional labeling, except as provided in (c)(1) (A) through (D) of this paragraph.

* * * * *

S5.4.3 *Reservoir labeling*—Each vehicle equipped with hydraulic brakes shall have a brake fluid warning statement that reads as follows, in letters at least one-eighth of an inch high: ''WARNING, Clean filler cap before removing. Use only _____ fluid from a sealed container.'' (Inserting the recommended type of brake fluid as specified in 49 CFR 571.116, e.g., ''DOT 3''). The lettering shall be—* * *

S5.5 *Antilock and variable proportioning brake systems.*

S5.5.1 On and after March 1, 1999, each vehicle with a GVWR greater than 10,000 pounds, except for any vehicle that has a speed attainable in 2 miles of not more than 33 mph, shall be equipped with an antilock brake system that directly controls the wheels of at least one front axle and the wheels of at least one rear axle of the vehicle. On and after March 1, 1999, on each vehicle with a GVWR greater than 10,000 pounds but not greater than 12,000 pounds, the antilock brake system may also directly control the wheels of the drive axle by means of a single sensor in the drive line. Wheels on other axles of the vehicle may be indirectly controlled by the antilock brake system.

S5.5.2 In the event of any failure (structural or functional) in an antilock or variable proportioning brake system, the vehicle shall be capable of meeting the stopping distance requirements specified in S5.1.2 for service brake system partial failure. For an EV that is equipped with both ABS and RBS that is part of the service brake system, the ABS must control the RBS.

* * * * *

S6.2 *Electric vehicles and electric brakes.*

S6.2.1 The state of charge of the propulsion batteries is determined in accordance with SAE Recommended Practice J227a, *Electric Vehicle Test Procedure,* February 1976. The applicable sections of J227a are 3.2.1 through 3.2.4, 3.3.1 through 3.3.2.2, 3.4.1 and 3.4.2, 4.2.1, 5.2, 5.2.1, and 5.3.

S6.2.2 At the beginning of the first effectiveness test specified in S7.3, and at the beginning of each burnishing procedure, each EV's propulsion battery is at the maximum state of charge recommended by the manufacturer, as stated in the vehicle operator's manual or on a label that is permanently attached to the vehicle, or, if the manufacturer has made no recommendation, at a state of charge of not less than 95 percent. If a battery is replaced rather than recharged, the replacement battery is to be charged and measured for state of charge in accordance with these procedures. During each burnish procedure, each propulsion battery is restored to the recommended state of charge or a state of charge of not less than 95 percent after each increment of 40 burnish stops until each burnish procedure is complete. The batteries may be charged at a more frequent interval if, during a particular 40-stop increment, the EV is incapable of achieving the initial burnish test speed. During each burnish procedure, the propulsion batteries may be charged by an external means or replaced by batteries that are charged to the state of charge recommended by the manufacturer or a state of charge of not less than 95 percent. For EVs having a manual control for setting the level of regenerative braking, the manual control, at the beginning of each burnish procedure, is set to provide maximum regenerative braking throughout the burnish.

S6.2.3 At the beginning of each performance test in the test sequence (S7,3, S7.5, S7.7 through S7.11, and S7.13 through S7.19 of this standard), unless otherwise specified, each propulsion battery of an EV is at the maximum state of charge recommended by the manufacturer, as stated in the vehicle operator's manual or on a label that is permanently attached to the vehicle, or, if the manufacturer has made no recommendation, at a state of charge of not less than 95 percent. If batteries are replaced rather than recharged, each replacement battery shall be charged and measured for state of charge in accordance with these procedures. No further charging of any propulsion battery occurs during any of the performance tests in the test sequence of this standard. If the propulsion batteries are depleted during a test sequence such that the vehicle reaches automatic shut-down, will not accelerate, or the low state of charge warning lamp is illuminated, the vehicle is to be accelerated to brake test speed by auxiliary means.

S6.2.4 (a) For an EV equipped with RBS, the RBS is considered to be part of the service brake system if it is automatically controlled by an application of the service brake control, if there is no means provided for the driver to disconnect or otherwise deactivate it, and if it is activated in all transmission positions, including neutral. The RBS is operational during all burnishes and all tests, except for the test of a failed RBS.

(b) For an EV equipped with an RBS that is not part of the service brake system, the RBS is operational and set

to produce the maximum regenerative braking effect during the burnishes, and is disabled during the test procedures. If the vehicle is equipped with a neutral gear that automatically disables the RBS, the test procedures which are designated to be conducted in gear may be conducted in neutral.

S6.2.5 For tests conducted ''in neutral,'' the operator of an EV with no ''neutral'' position (or other means such as a clutch for disconnecting the drive train from the propulsion motor(s)) does not apply any electromotive force to the propulsion motor(s). Any electromotive force that is applied to the propulsion motor(s) automatically remains in effect unless otherwise specified by the test procedure.

S6.2.6 A vehicle equipped with electrically-actuated service brakes also performs the following test series. Conduct 10 stopping tests from a speed of 100 kph or the maximum vehicle speed, whichever is less. At least two of the 10 stopping distances must be less than or equal to 70 meters. The vehicle is loaded to GVWR for these tests and the transmission is in the neutral position when the service brake control is actuated and throughout the remainder of the test. The battery or batteries providing power to those electrically-actuated brakes, at the beginning of each test, shall be in a depleted state of charge for conditions (a), (b), or (c) of this paragraph as appropriate. An auxiliary means may be used to accelerate an EV to test speed.

(a) For an EV equipped with electrically-actuated service brakes deriving power from the propulsion batteries, and with automatic shut-down capability of the propulsion motor(s), the propulsion batteries are at not more than five percent above the EV actual automatic shut-down critical value. The critical value is determined by measuring the state-of-charge of each propulsion battery at the instant that automatic shut-down occurs and averaging the states-of-charge recorded.

(b) For an EV equipped with electrically-actuated service brakes deriving power from the propulsion batteries, and with no automatic shut-down capability of the propulsion motor(s), the propulsion batteries are at an average of not more than five percent above the actual state of charge at which the brake failure warning signal, required by S5.3.1(e) of this standard, is illuminated.

(c) For a vehicle which has an auxiliary battery (or batteries) that provides electrical energy to operate the electrically-actuated service brakes, the auxiliary battery(batteries) is (are) at (at an average of) not more than five percent above the actual state of charge at which the brake failure warning signal, required by S5.3.1(e) of this standard, is illuminated.

* * * * *

S7.7.1 *Test procedure for requirements of S5.2.1.*

* * * * *

S7.7.1.3 With the vehicle held stationary by means of the service brake control, apply the parking brake by a single application of the force specified in (a), (b), or (c) of this paragraph, except that a series of applications to achieve the specified force may be made in the case of a parking brake system design that does not allow the application of the specified force in a single application:

* * * * *

(c) For a vehicle using an electrically-activated parking brake, apply the parking brake by activating the parking brake control.

* * * * *

S7.9 *Service brake system test—partial failure.*

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S7.9.5 For a vehicle in which the brake signal is transmitted electrically between the brake pedal and some or all of the foundation brakes, regardless of the means of actuation of the foundation brakes, the tests in S7.9.1 through S7.9.3 of this standard are conducted by inducing any single failure in any circuit that electrically transmits the brake signal, and all other systems intact. Determine whether the brake system indicator lamp is activated when the failure is induced.

S7.9.6 For an EV with RBS that is part of the service brake system, the tests specified in S7.9.1 through S7.9.3 are conducted with the RBS disconnected and all other systems intact. Determine whether the brake system indicator lamp is activated when the RBS is disconnected.

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S7.10 *Service brake system-inoperative brake power unit or brake power assist unit test.* (For vehicles equipped with brake power unit or brake power assist unit.)

* * * * *

S7.10.3 *Electric brakes.*

(a) For vehicles with electrically-actuated service brakes, the tests in S7.10.1 or S7.10.2 are conducted with any single electrical failure in the electric brake system instead of the brake power or brake power assist systems, and all other systems intact.

(b) For EVs with RBS that is part of the service brake system, the tests in S7.10.1 or S7.10.2 are conducted with the RBS discontinued and all other systems intact.

3. Section 571.135 is amended by:

a. Revising S3;

b. Revising the definitions of ''maximum speed'', and ''split service brake system'' in S4, and adding in S4, in alphabetical order, definitions for ''Electric vehicle'', ''Electrically-actuated service brakes'', and ''Regenerative braking system'';

c. Adding S5.1.3;

d. Revising the introductory text of S5.4.3 and S5.5.1 and adding S5.5.1 (e),(f), and (g);

e. Revising the introductory text of S5.5.5(d);

f. Adding S6.3.11.1, S6.3.11.2, S6.3.11.3, S6.3.12, and S6.3.13;

g. Adding S7.2.4(f), S7.4.5.1, and S7.7.3(h)

h. Revising S7.10, S7.10.3(f), and S7.10.4;

i. Adding S7.11.3 (m) and (n); and

j. Revising S7.12.2(i).

The revised and added paragraphs read as follows:

§ 571.135 Standard No. 135; Passenger Car Brake Systems.

* * * * *

S3 *Application.* This standard applies to passenger cars manufactured on or after September 1, 2000. In addition, passenger cars manufactured before September 1, 2000 may, at the option of the manufacturer, meet the requirements of this standard instead of Federal Motor Vehicle Safety Standard No. 105 *Hydraulic and Electric Brake Systems.*

S4. *Definitions.*

* * * * *

Electric vehicle or *EV* means a motor vehicle that is powered by an electric motor drawing current from rechargeable storage batteries, fuel cells, or other portable sources of electrical current, and which may include a non-electrical source of power designed to charge batteries and components thereof.

Electrically-actuated service brakes means service brakes that utilize electrical energy to actuate the foundation brakes.

* * * * *

Maximum speed of a vehicle or *VMax* means the highest speed attainable by accelerating at a maximum rate from a standing start for a distance of 3.2 km (2 miles) on a level surface, with the vehicle at its lightly loaded vehicle weight, and, if an EV, with the propulsion batteries at a state of charge of not less than 95 percent at the beginning of the run.

* * * * *

Regenerative braking system or *RBS* means an electrical energy system that is installed in an EV for recovering or dissipating kinetic energy, and which uses the propulsion motor(s) as a retarder for partial braking of the EV while returning electrical energy to the propulsion battery(s) or dissipating electrical energy.

Split service brake system means a brake system consisting of two or more subsystems actuated by a single control, designed so that a single failure in any subsystem (such as a leakage-type failure of a pressure component of a hydraulic subsystem except structural failure of a housing that is common to two or more subsystems, or an electrical failure in an electric subsystem) does not impair the operation of any other subsystem.

* * * * *

S5.1.3 *Regenerative braking system.* (a) For an EV equipped with RBS, the RBS is considered to be part of the service brake system if it is automatically activated by an application of the service brake control, if there is no means provided for the driver to disconnect or otherwise deactivate it, and if it is activated in all transmission positions, including neutral.

(b) For an EV that is equipped with both ABS and RBS that is part of the service brake system, the ABS must control the RBS.

* * * * *

S5.4.3. *Reservoir labeling.* Each vehicle equipped with hydraulic brakes shall have a brake fluid warning statement that reads as follows, in letters at least 3.2 mm (⅛ inch) high: ''WARNING: Clean filler cap before removing. Use only _____ fluid from a sealed container.'' (Inserting the recommended type of brake fluid as specified in 49 CFR 571.116, *e.g.,*''DOT 3.'') The lettering shall be:

* * * * *

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:

* * * * *

(e) For a vehicle with electrically-actuated service brakes, failure of the source of electric power to those brakes, or diminution of state of charge of the batteries to less than a level specified by the manufacturer for the purpose of warning a driver of degraded brake performance.

(f) For a vehicle with electric transmission of the service brake control signal, failure of a brake control circuit.

(g) For an EV with a regenerative braking system that is part of the service brake system, failure of the RBS. An amber lamp may be used displaying the symbol ''RBS.'' RBS failure in a system that is part of the service brake system may also be indicated by an amber lamp that also indicates ABS failure and displays the symbol ''ABS/RBS''.

* * * * *

S5.5.5. *Labeling.*

* * * * *

(d) If separate indicators are used for one or more of the conditions described in S5.5.1(a) through S5.5.1(g), the indicators shall display the following wording:

* * * * *

S6.3.11 *State of charge of batteries for EVs.*

S6.3.11.1 The state of charge of the propulsion batteries is determined in accordance with SAE Recommended Practice J227a, *Electric Vehicle Test Procedure,* February 1976. The applicable sections of J227a are 3.2.1 through 3.2.4, 3.3.1 through 3.3.2.2, 3.4.1 and 3.4.2, 4.2.1, 5.2, 5.2.1 and 5.3.

S6.3.11.2 At the beginning of the burnish procedure (S7.1 of this standard) in the test sequence, each propulsion battery is at the maximum state of charge recommended by the manufacturer, as stated in the vehicle operator's manual or on a label that is permanently attached to the vehicle, of, if the manufacturer has made no recommendation, not less than 95 percent. During the 200-stop burnish procedure, the propulsion batteries are restored to the maximum state of charge determined as above, after each increment of 40 burnish stops until the burnish procedure is complete. The batteries may be charged at a more frequent interval during a particular 40-stop increment only if the EV is incapable of achieving the initial burnish test speed during that increment. During the burnish procedure, the propulsion batteries may be charged by external means or replaced by batteries that are at a state of charge of not less than 95 percent. For an EV having a manual control for setting the level of regenerative braking, the manual control, at the beginning of the burnish procedure, is set to provide maximum regenerative braking throughout the burnish.

S6.3.11.3 At the beginning of each performance test in the test sequence (S7.2 through S7.17 of this standard), unless otherwise specified, an EV's propulsion batteries are at the state of charge recommended by the manufacturer, as stated in the vehicle operator's manual or on a label that is permanently attached to the vehicle, or, if the manufacturer has made no recommendation, at a state of charge of not less than 95 percent. No further charging of any propulsion battery occurs during any of the performance tests in the test sequence of this standard. If the propulsion batteries are depleted during a test sequence such that the vehicle reaches automatic shut-down, will not accelerate, or the low state of charge brake warning lamp is illuminated, the vehicle is to be accelerated to brake test speed by auxiliary means. If a battery is replaced rather than recharged, the replacement battery shall be charged and measured for state of charge in accordance with these procedures.

S6.3.12 *State of charge of batteries for electrically-actuated service brakes.* A vehicle equipped with electrically-actuated service brakes also performs the following test series. Conduct 10 stopping tests from a speed of 100 kph or the maximum vehicle speed, whichever is less. At least two of the 10 stopping distances must be less than or equal to 70 meters. The vehicle is loaded to GVWR and the transmission is in the neutral position when the service brake control is actuated and throughout the remainder of the test. Each battery providing power to the electrically-actuated service brakes, shall be in a depleted state of charge for conditions (a), (b), or (c) of this paragraph as appropriate. An auxiliary means may be used to accelerate an EV to test speed.

(a) For an EV equipped with electrically-actuated service brakes deriving power from the propulsion batteries and with automatic shut-down capability of the propulsion motor(s), the propulsion batteries are at not more than five percent above the EV actual automatic shut-down critical value. The critical value is determined by measuring the state-of-charge of each propulsion battery at the instant that automatic shut-down occurs.

(b) For an EV equipped with electrically-actuated service brakes deriving power from the propulsion batteries and with no automatic shut-down capability of the propulsion motor(s), the propulsion batteries are at an average of not more than five percent above the actual state of charge at which the brake failure warning signal, required by S5.5.1(e) of this standard, is illuminated.

(c) For a vehicle which has one or more auxiliary batteries that provides electrical energy to operate the electrically-actuated service brakes, each auxiliary battery is at not more than five percent above the actual state of charge at which the brake failure

warning signal, required by S5.5.1(e) of this standard, is illuminated.

S6.3.13 *Electric vehicles.*

S6.3.13.1 (a) For an EV equipped with an RBS that is part of the service brake system, the RBS is operational during the burnish and all tests, except for the test of a failed RBS.

(b) For an EV equipped with an RBS that is not part of the service brake system, the RBS is operational and set to produce the maximum regenerative braking effect during the burnish, and is disabled during the test procedures. If the vehicle is equipped with a neutral gear that automatically disables the RBS, the test procedures which are designated to be conducted in gear may be conducted in neutral.

S6.3.13.2 For tests conducted ''in neutral'', the operator of an EV with no ''neutral'' position (or other means such as a clutch for disconnecting the drive train from the propulsion motor(s)) does not apply any electromotive force to the propulsion motor(s). Any electromotive force that is applied to the propulsion motor(s) automatically remains in effect unless otherwise specified by the test procedure.

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S7.2.4 *Performance requirements.*

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(f) An EV with RBS that is part of the service brake system shall meet the performance requirements over the entire normal operating range of the RBS.

* * * * *

S7.4.5 *Performance requirements.*

* * *

S7.4.5.1 An EV with RBS that is part of the service brake system shall meet the performance requirement over the entire normal operating range of the RBS.

* * * * *

S7.7.3. *Test conditions and procedures.*

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(h) For an EV, this test is conducted with no electromotive force applied to the vehicle propulsion motor(s), but with brake power or power assist still operating, unless cutting off the propulsion motor(s) also disables those systems.

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S7.10 *Partial failure.*

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S7.10.3. *Test conditions and procedures.*

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(f) Alter the service brake system to produce any single failure. For a hydraulic circuit, this may be any single rupture or leakage type failure, other than a structural failure of a housing that is common to two or more subsystems. For a vehicle in which the brake signal is transmitted electrically between the brake pedal and some or all of the foundation brakes, regardless of the means of actuation of the foundation brakes, this may be any single failure in any circuit that electrically transmits the brake signal. For an EV with RBS that is part of the service brake system, this may be any single failure in the RBS.

* * * * *

S7.10.4 *Performance requirements.* For vehicles manufactured with a split service brake system, in the event of any failure in a single subsystem, as specified in S7.10.3(f) of this standard, and after activation of the brake system indicator as specified in S5.5.1, the remaining portions of the service brake system shall continue to operate and shall stop the vehicle as specified in S7.10.4(a) or S7.10.4(b). For vehicles not manufactured with a split service brake system, in the event of any failure in any component of the service brake system, as specified in S7.10.3(f), and after activation of the brake system indicator as specified in S5.5.1 of this standard, the vehicle shall, by operation of the service brake control, stop 10 times consecutively as specified in S7.10.4(a) or S7.10.4(b).

S7.11.3. *Test conditions and procedures.*

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(m) For vehicles with electrically-actuated service brakes (brake power unit), this test is conducted with any single electrical failure in the electrically-actuated service brakes instead of a failure of any other brake power or brake power assist unit, and all other systems intact.

(n) For an EV with RBS that is part of the service brake system, this test is conducted with the RBS disconnected and all other systems intact.

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S7.12.2. *Test conditions and procedures.*

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(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.

* * * * *

Issued on: August 26, 1997.

Ricardo Martinez, M.D.

Administrator.

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DEPARTMENT OF TRANSPORTATION

Surface Transportation Board

49 CFR Part 1206

[STB Ex Parte No. 569]

Removal of Obsolete Motor Passenger Carrier Accounting Regulations

AGENCY: Surface Transportation Board, DOT.

ACTION: Final rule.

SUMMARY: The Surface Transportation Board (Board) is removing from the Code of Federal Regulations obsolete rules concerning the Uniform System of Accounts for motor carriers of passengers.

EFFECTIVE DATE: This rule is effective September 5, 1997.

FOR FURTHER INFORMATION CONTACT: Beryl Gordon, (202) 565–1600. [TDD for the hearing impaired: (202) 565–1695.]

SUPPLEMENTARY INFORMATION: Effective January 1, 1996, the ICC Termination Act of 1995, Pub. L. No. 104–88, 109 Stat. 803 (ICCTA), abolished the Interstate Commerce Commission (ICC or Commission) and established the Board within the Department of Transportation. Section 204(a) of the ICCTA provides that ''[t]he Board shall promptly rescind all regulations established by the [ICC] that are based on provisions of law repealed and not substantively reenacted by this Act.''

The regulations in part 1206, establishing a Uniform System of Accounts (USOA) for motor carriers of passengers, were originally issued in 1937. In response to the Motor Carrier Act of 1935, the ICC adopted the regulations pursuant to former section 204 of the Interstate Commerce Act. 2 FR 2689 (December 8, 1937).[1] Section 204 was recodified in 1978 at 49 U.S.C. 11142.[2] Motor passenger carriers used the USOA to develop data for annual and quarterly reports in accordance with 49 CFR part 1249.

In *Elimination of Acctg. & Reporting Reqts. for Motor Carriers of Passengers,* 3 I.C.C.2d 796 (1987), the ICC adopted new accounting and reporting rules for motor passenger carriers. The ICC reduced the quarterly and annual reports prescribed in 49 CFR 1249 to a one-page format. The ICC also decided that the USOA would no longer be prescribed as the basis of motor carrier

[1] They were first published at 49 CFR part 181.

[2] This section provided that the ICC ''may prescribe a uniform accounting system for classes of carriers providing . . . transportation subject to the jurisdiction of the Commission under subchapters II, III, and IV . . . of this title.''