



**DEPARTMENT OF TRANSPORTATION**

**[4910-EX-P]**

**Federal Motor Carrier Safety Administration**

**49 CFR Part 393 and Appendix G to Subchapter B of Chapter III**

**[Docket No. FMCSA–2010-0257]**

**RIN 2126–AB28**

**Parts and Accessories Necessary for Safe Operation: Brakes; Adjustment Limits**

**AGENCY:** Federal Motor Carrier Safety Administration, DOT.

**ACTION:** Final Rule.

**SUMMARY:** The Federal Motor Carrier Safety Administration (FMCSA) amends the requirements regarding brake readjustment limits in the Federal Motor Carrier Safety Regulations (FMCSRs). This rule amends the readjustment limits, clarifies their application, and corrects an error in cross-referencing a Federal Motor Vehicle Safety Standard (FMVSS). This rule responds to a petition for rulemaking from the Commercial Vehicle Safety Alliance (CVSA).

**DATES:** *Effective Date:* This final rule becomes effective [*Insert date 30 days after publication in the Federal Register*].

*Petitions for Reconsideration* of this final rule must be submitted to the FMCSA Administrator no later than [*Insert date 30 days after publication in the Federal Register*]

**ADDRESSES:** Please include the Docket ID Number FMCSA-2010-0257 or the Regulatory identification Number (RIN) 2126-AB28 in the subject line of your petition, and submit it by any of the following methods:

Federal eRulemaking Portal: <http://www.regulations.gov>. Follow the online instructions for submitting comments.

Mail: Docket Management Facility: U.S. Department of Transportation, 1200 New Jersey Avenue, SE, West Building, Ground Floor, Room W12-140, Washington, DC 20590-0001.

Hand Delivery or Courier: West Building, Ground Floor, Room W12-140, 1200 New Jersey Avenue, SE, between 9 a.m. and 5 p.m. ET, Monday through Friday, except Federal holidays.

Fax: 202-493-2251.

**FOR FURTHER INFORMATION CONTACT:** Ms. Deborah M. Freund, Vehicle and Roadside Operations Division, Office of Bus and Truck Standards and Operations (MC-PSV), Federal Motor Carrier Safety Administration, 1200 New Jersey Avenue SE, Washington, DC 20590-0001; [deborah.freund@dot.gov](mailto:deborah.freund@dot.gov); telephone (202) 366-5370.

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### **I. Abbreviations**

ATA	American Trucking Associations
CMV	commercial motor vehicle
CVSA	Commercial Vehicle Safety Alliance
DOT	U.S. Department of Transportation
FHWA	Federal Highway Administration
FMCSRs	Federal Motor Carrier Safety Regulations
FMVSSs	Federal Motor Vehicle Safety Standards
NHTSA	National Highway Traffic Safety Administration
NPRM	Notice of Proposed Rulemaking

OOS out of service  
SAE Society of Automotive Engineers

## **II. Legal Basis for the Rulemaking**

This final rule is based on the authority of the Motor Carrier Act of 1935 (Pub. L. 74-255, 49 Stat. 543, August 9, 1935, now codified at 49 U.S.C. 31502(b)) (1935 Act) and the Motor Carrier Safety Act of 1984 (Pub. L. 98-554, Title II, 98 Stat. 2832, October 30, 1984) (the 1984 Act), both of which provide broad discretion to the Secretary of Transportation (Secretary) in implementing their provisions.

The 1935 Act provides that the Secretary may prescribe requirements for (1) qualifications and maximum hours of service of employees of, and safety of operation and equipment of, a motor carrier [49 U.S.C. 31502(b) (1)], and (2) qualifications and maximum hours of service of employees of, and standards of equipment of, a motor private carrier, when needed to promote safety of operation [section 31502(b) (2)]. This final rule is based on the Secretary's authority to regulate the safety and standards of equipment of for-hire and private carriers.

The 1984 Act gives the Secretary concurrent authority to regulate drivers, motor carriers, and vehicle equipment. Codified in 49 U.S.C. 31136(a), section 206(a) of the Act requires the Secretary to publish regulations on commercial motor vehicle (CMV) safety. Specifically, the Act sets forth minimum safety standards to ensure that (1) CMVs are maintained, equipped, loaded, and operated safely [section 31136(a)(1)]; (2) the responsibilities imposed on operators of CMVs do not impair their ability to operate the vehicles safely [section 31136(a)(2)]; (3) the physical condition of CMV operators is adequate to enable them to operate the vehicles safely [section 31136(a)(3)]; and (4) the

operation of CMVs does not have a deleterious effect on the physical condition of the operators [section 31136(a)(4)].

The rule provides improved guidance concerning CMV brake adjustment limits. The revised requirements concerning maximum pushrod stroke for brake actuators will enhance the braking performance of the vehicle, consistent with section 31136(a)(1). The rule is not concerned with the responsibilities or physical condition of drivers addressed by section 31136(a)(2) and (3), respectively, and deals with section 31136(a)(4) only to the extent that a safer vehicle is less likely to have a deleterious effect on the physical condition of a driver. Before prescribing any such regulations, however, FMCSA must consider the “costs and benefits” of any proposal (49 U.S.C. 31136(c)(2)(A) and 31502(d)).

### **III. Background**

Appendix G, Minimum Periodic Inspection Standards, was added to the FMCSRs in 1988 (53 FR 49411, Dec. 7, 1988). Under the inspection standards of Appendix G, all items required to be inspected must be in proper adjustment, must not be defective, and must function properly before a commercial motor vehicle (CMV) is placed in service. Appendix G includes, among many other things, brake adjustment (readjustment) limits. Paragraph 1.a.(5) of this appendix currently states that the maximum stroke at which brakes should be readjusted is given below. Any brake 1/4" or more past the readjustment limit or any two brakes less than 1/4" beyond the readjustment limit shall be cause for rejection. Stroke shall be measured with engine off and reservoir pressure of 80 to 90 psi with brakes fully applied.

The figures in the rightmost column of each of the three tables following paragraph 1.a.(5) indicate the maximum stroke at which brakes should be readjusted.

Subsequently, in June 1991, the Society of Automotive Engineers (SAE) (now known as SAE International) developed International Recommended Practice J1817 (SAE J1817) to provide a marking system that distinguishes long-stroke from standard-stroke air brake actuators, rotochambers, and their components. It defines “rated stroke” as the minimum design stroke of a brake actuator.

The 2001 revision of SAE J1817 includes tables listing recommended values for minimum rated stroke and maximum readjustment stroke for clamp band/sealed design standard-stroke brake actuators (Table 1A), clamp band/sealed design long-stroke brake actuators (Table 1B), and rotochamber designs (Table 1C). Table 1B is further broken down to include three classes of long-stroke actuators. The classes are defined according to the range of difference between the maximum readjustment stroke and the standard rated stroke. In most but not all cases, the maximum readjustment stroke is 80 percent of the minimum rated stroke. The differences are greatest for the smaller sizes of brake chambers.

In 1997, the Federal Highway Administration (FHWA), FMCSA’s predecessor agency within the U.S. Department of Transportation (DOT), published in the Federal Register an NPRM titled “Parts and Accessories Necessary for Safe Operation; General Amendments” (62 FR 18169, Apr. 14, 1997). The NPRM proposed various amendments to 49 CFR part 393 and 49 CFR part 571, which generally did not establish new or more stringent requirements but clarified existing requirements.

As part of that NPRM, FHWA proposed to add a new § 393.47(e) to the FMCSRs to specify the maximum permissible stroke for different types (sizes) of brake chambers and incorporate by reference SAE J1817, Long-Stroke Air-Brake Actuator Marking (June 1991). The NPRM proposed to require that the maximum values for pushrod stroke for clamp- and rotochamber-type actuators must be less than 80 percent of the rated strokes listed in SAE J1817, or 80 percent of the rated stroke marked on the brake chamber by the chamber manufacturer, or the readjustment limit marked on the brake chamber by the chamber manufacturer. For types 16 and 20 long-stroke clamp-type brake actuators, the NPRM proposed that the pushrod stroke must be less than 51 mm (2 in.), or 80 percent of the rated stroke marked on the brake chamber by the chamber manufacturer, or the readjustment limit marked on the brake chamber by the chamber manufacturer. The NPRM did not propose to revise the Appendix G brake readjustment-limits tables.

FMCSA published the final rule on August 15, 2005 (70 FR 48007). The Agency revised § 393.47(e) as proposed, except that it incorporated by reference the July 2001 revision of SAE J1817 rather than the June 1991 edition. No commenters to the docket for that rulemaking addressed the proposed incorporation by reference of SAE J1817.

#### **IV. CVSA's Petition**

On April 16, 2007, CVSA petitioned the Agency to revise § 393.47(e). CVSA stated that, although the readjustment (or brake actuator stroke) limits of SAE J1817 are consistent with those listed in Appendix G and CVSA's North American Standard Out-of-Service (OOS) Criteria, § 393.47(e) "specifies readjustment (stroke) limits based on 80 percent of the rated (full) strokes listed in SAE J1817." Relying on this criterion introduces discrepancies between § 393.47(e) and SAE J1817. Although the readjustment

limits listed in SAE J1817 agree with those in Appendix G and the OOS Criteria, they differ, for some brake chambers, from the “80 percent of rated stroke” specified in § 393.47(e). Consequently, “[t]he enforcement and/or noting of § 393.47(e) violations by cross-referencing the regulation to 80% of SAE J1817 – Long Stroke Air-Brake Actuator Marking, July, 2001 is proving problematic for inspectors and industry.”

CVSA also pointed out that § 393.47(e) considers a brake with the stroke at the readjustment limit to be out of adjustment. In contrast, both Appendix G and the OOS Criteria state that the brake pushrod stroke must exceed the readjustment limit for the brake to be considered out of adjustment. The petitioners added that the values in both Appendix G and the OOS Criteria were established consistent with brake manufacturers’ recommendations. Although the CVSA subsequently updated the OOS Criteria to include several types of long-stroke clamp-type brake chambers, FMCSA has not similarly revised the Appendix G values.

In addition, CVSA requested that FMCSA revise § 393.53, Automatic brake adjusters and brake adjustment indicators, to include references to the applicable requirements for such equipment on trailers. Sections 393.53(b) and (c) would be revised to include a reference to paragraph S5.2.2 so that the Federal Motor Vehicle Safety Standard (FMVSS) citations include the reference to trailers and read, “49 CFR 571.121, S5.1.8 or S5.2.2.”

On June 10, 2008, CVSA amended its April 2007 petition to correct the text of the table subheadings for clamp-type and rotochamber-type chamber data in the original petition and to add tables for Bendix DD-3 and bolt-type brake chamber data. The amended petition changed the table subheadings “Brake Chamber Pushrod Stroke Limit”

and “RC Actuate Pushrod Stroke Limit” to read “Brake Adjustment Limit” and “Rotochamber Type Brake Chamber Data,” respectively.

FMCSA has placed copies of CVSA’s 2007 petition and 2008 correction in the docket for this rulemaking.

## **V. NPRM; Comments Received**

In response to the CVSA petition, FMCSA published a notice of proposed rulemaking in the Federal Register on September 2, 2011 (76 FR 54721).

The Agency received comments from CVSA, the American Trucking Associations (ATA), the Heavy Duty Manufacturers Association (HDMA), and Meritor WABCO Vehicle Control Systems (Meritor WABCO).

*1. Revise and expand the readjustment limit tables, and include in § 393.47 and Appendix G.* The NPRM proposed to revise and expand the readjustment-limits tables as recommended by CVSA, and to include these revised tables in § 393.47(e) and Appendix G. The revised tables cover readjustment limits not only for clamp-, bolt-, and rotochamber-type brake chambers, but also for Bendix DD-3 chambers. The table for clamp-type brake chambers also differentiates between readjustment limits for more sizes of standard-stroke and long-stroke chambers.

All commenters supported the inclusion of the proposed readjustment limit tables in § 393.47(e) and Appendix G. Meritor WABCO stated that “The addition of the tables will clarify the chamber stroke limits and reduce confusion in the field. Including these tables in both ... § 393.47(e) and Appendix G will eliminate the need for cross-referencing in the regulation. The additional text (after the tables) is also appropriate to

reinforce the chamber manufacturers' use of marking and labeling of their actuators with the rated or readjustment strokes.”

With regard to all proposed readjustment limit tables, CVSA suggests that the Agency consider increasing the metric conversions to tenths of a millimeter. CVSA has found that roadside enforcement officers who are trained using metric measurement (whether in Canada or other jurisdictions) benefit from the additional decimal place, especially in making conversions or comparisons from Imperial to Metric, or vice versa, when reference materials or data system entries require them. Furthermore, Canada's pending National Safety Code (NSC) Standard 11 update, to be implemented in 2013, and CVSA's Out-of-Service Criteria (OOSC) will be adopting metric conversions expressed to the tenth of a millimeter for the same reason.

CVSA advised FMCSA of a typographical error concerning the Type A chamber outside diameter. The value shown in the NPRM is 6 5/16 inch (176 mm). The correct value is 6 15/16 inch (176 mm).

*Agency Response.* The Agency amends § 393.47(e) and Appendix G to include readjustment limit tables. The Agency has included metric measurements to the tenth of a millimeter as suggested by CVSA, and has corrected the typographical error for the Type A chamber outside diameter.

2. Threshold for brake adjustment violation, § 393.47(e). The NPRM proposed changes to paragraph 1a(5) of Appendix G, “Brake System, Service Brakes,” to be consistent with the § 393.47(e) requirement that pushrod stroke be less than the values specified in the accompanying tables.

In support of this proposed amendment, the NPRM stated:

An s-cam brake that is at the readjustment limit when it is cold will be beyond the readjustment limit when it gets hot. FMCSA believes that vehicles should not be dispatched with brakes at the readjustment limit, because those brakes will be found to be beyond the adjustment limit – and out of compliance with the regulations – if evaluated during a roadside inspection after the brakes have become hot due to operational use... The Agency believes, however, that it is appropriate to require motor carriers to take action under the requirements of § 393.47 when a brake is at the adjustment limit. ... To avoid confusion in the enforcement community and the industry, this NPRM proposes to amend Appendix G to make its requirements consistent with those of § 393.47(e) adopted in the August 2005 rule.

Both CVSA and Meritor WABCO opposed the NPRM proposal that would require pushrod stroke to be less than the values specified in the tables. Instead, the commenters recommended that the out-of-adjustment criteria in § 393.47 be when the brake stroke is greater than the established limits, as recommended by CVSA in its original petition. In support of its position CVSA stated:

CVSA maintains its recommendation that brake out-of-adjustment findings should be made when pushrod stroke exceeds the limits listed in the adjustment limit tables, rather than the proposed requirement that they must be less than established adjustment limits.... The reasons for this convention, now uniformly used by CVSA in training and in enforcement, are twofold. [Emphasis added.]

First, consistency is important in roadside enforcement...The 20 percent rule gives inspectors and commercial vehicle operators clear and consistent expectations relative to proper brake adjustment and out of service conditions. Prior to the 1996 change to the OOSC, inspectors were mixed as to whether or not they determined a brake measured at the stroke limit to be the out of adjustment. The [1996] change to using brake stroke measurements found beyond the adjustment limit to be out of adjustment established much better consistency.

Second, fairness and compliance with the regulation are critical for successful enforcement.... By using brake stroke measurements that exceed adjustment limits as the criteria for being out of adjustment, inspectors make more consistent and, we believe, fairer assessments.... [Emphasis added.]

Ultimately, CVSA determined that amending the OOSC to consider brake stroke measured beyond the established limits, rather than at the limits, would address both aforementioned needs—to be both more consistent and fair in enforcement—without markedly changing the training. Indeed, we believe the move to penalizing brake stroke beyond rather than at the adjustment limits shifts out-of-

service findings using the 20 percent rule to be more consistent with the intent of the rule.

CVSA respectfully disagrees with the agency's reasoning for denying this part of our petition. We acknowledge that s-cam brakes, when heated, will exhibit an increase in brake stroke. However, brake stroke adjustment limits were established with reserve stroke included under SAE J1817 in order to, at least in part, accommodate for such normal in-service increases in stroke as those due to thermal expansion. Furthermore, as with all roadside enforcement determinations, inspectors can only assess the as is condition of the vehicle—not what might be the case one mile or more miles down the road.

*Agency Response.* Although SAE J 1817 does not appear to make an explicit statement concerning reserve stroke, the concept is described in detail in the UMTRI study referenced in the NPRM (“Evaluation of Brake Adjustment Criteria for Heavy Trucks,” FHWA-MC-94-016, March 1995). And, as FMCSA noted in the NPRM, citing that study, “Although in some cases, the readjustment limits listed in SAE J1817 are 80 percent of the rated stroke for a given actuator, deviations exist.” (76 FR 54721, at 54723). Because of the inherent challenge in making precise measurements of brake stroke, the proposed requirement for measured values to be “less than” the figures in the tables could, in practice, be taken as requiring measurements as much as 1/8 inch less than the values shown. In contrast, the CVSA’s recommendation for measurements to “not be greater than” the value specified would require values to be less than or equal to the values shown in the table.

Based on the above, and to be clear that pushrod stroke measured to be at the adjustment limit is not considered out of adjustment, FMCSA amends the language in § 393.47 (e) to read as follows: “The pushrod stroke for clamp- and rotochamber brake actuator must not be greater than the values specified in the following tables:”.

3. Threshold for periodic inspection, Appendix G. CVSA and Meritor WABCO noted that under the current wording of Section 1.a(5) of Appendix G (as well as in the proposed amendment to the same section in the NPRM), a vehicle successfully meeting the annual inspection requirements concerning brake adjustment would be issued a brake out-of-adjustment violation if inspected at roadside. Both commenters recommended dropping any reference to specific readjustment limits in Section 1.a(5) of Appendix G.

CVSA noted “that referencing a specific length of stroke in excess of the adjustment limits for any one, or two brakes especially, may misguide maintenance personnel into not adjusting brakes that should be adjusted since a vehicle meeting the annual inspection standard as proposed would, to the contrary, already be in violation of the FMCSRs as they are enforced at roadside. As an example, a single brake measuring 1/8 inches past the adjustment limit would be considered out-of-adjustment at roadside but would meet the wording provided for in the Appendix G proposal.” Similarly, Meritor WABCO noted that “Further, the proposed wording in Appendix G results in confirming an acceptable maintenance inspection, allowing vehicles to be put back in service when brake strokes exceed the readjustment limit by 1/4 inch or less.”

*Agency Response.* CVSA and Meritor WABCO are correct in stating that a CMV could pass a periodic inspection yet be found to be in violation when inspected at roadside.

To maintain consistency between § 393.47 and Appendix G, the Agency amends the Appendix G threshold to be the same as that in the amended § 393.47 (e) as follows: “Any brake stroke exceeding the readjustment limit will be rejected:”

4. Eliminate the incorporation by -reference to SAE J1817 in § 393.7(b)(15). The NPRM proposed to eliminate the incorporation by reference to SAE J1817 in §393.47(e). Inclusion of the new tables in §393.47(e) would provide explicit readjustment limits for each type of actuator, eliminating the need for the cross-reference.

HDMA and Meritor WABCO supported this amendment, and HDMA noted that “...removing the reference to SAE J1817 Long Stroke Air Brake Actuator Marking, July 2001 is appropriate and reduces future confusion between the sections involved in this NPRM.”

*Agency Response.* The Agency amends § 393.7 by eliminating § 393.7(b)(15).

5. Revise § 393.53 to add a cross-reference to the Federal Motor Vehicle Safety Standard applicable to trailers. The NPRM proposed to revise § 393.53(b) and (c) to add a cross-reference to FMVSS No. 121, S5.2.2. Although the introductory text of each paragraph clearly states that it is applicable to “each commercial motor vehicle,” § 393.53(b) and (c) omit a cross-reference to the FMVSSs applicable to trailers (S5.2.2). The NPRM proposed to add this cross-reference to eliminate potential confusion.

CVSA, Meritor WABCO, and HDMA all supported this change.

*Agency Response.* FMCSA amends § 393.53(b) and (c) to add a cross-reference to FMVSS No. 121, S5.2.2.

6. Recommendation to use common terminology. In its comment to the docket, CVSA suggested that the agency consider clarifying a number of terms used to describe brake actuator pushrod stroke and adjustment status and limits to make the meanings clearer to vehicle operators and inspectors. CVSA noted examples such as “readjustment” and “adjustment;” and “pushrod travel” and “pushrod stroke.” CVSA also believes there is an

opportunity to improve the public awareness regarding the function of automatic slack adjusters, citing the National Transportation Safety Board's 2006 Safety Recommendations (H-06-001 and H-06-002) that CVSA and FMCSA should work to improve training and proficiency on brake adjustment, and specifically that brake systems with automatic slack adjusters should not be manually adjusted.

Agency Response: FMCSA has made, and continues to make, revisions to clarify its regulatory and safety outreach materials. In many cases, however, the Agency must use technical terms that are consistent with those used by other safety agencies (particularly the National Highway Traffic Safety Administration (NHTSA)) and by standards development organizations (such as SAE International). Responding to CVSA's comment, FMCSA will use the terms "pushrod stroke" rather than "pushrod travel," and "readjustment limit" rather than "adjustment limit" in regulatory text.

Reflecting the longstanding concerns about manual adjustment of automatic brake adjusters (also known as self-adjusting brake adjusters), FMCSA advised the NTSB by letter on October 15, 2009 that, in conjunction with CVSA, the Agency had taken action to modify the North American Standard Inspection training materials to include a module about the potential safety risks associated with manually adjusting automatic slack adjusters. The NTSB acknowledged this effort and classified Safety Recommendation H-06-001 "Closed – Acceptable Action" on August 10, 2010.

The following language will now be used on inspection reports: "This vehicle has brake adjustment violations. Section 393.53 of 49 CFR requires that this vehicle be equipped with a self-adjusting brake system. A qualified service technician needs to determine why the defective brake has excessive stroke and make the appropriate repair.

Simply re-adjusting a self-adjusting brake adjuster, or replacing it, does not guarantee that the problem is corrected. The problem may exist in the foundation brake system. By certifying this inspection report you have indicated that this vehicle now has a properly functioning self-adjusting brake adjustment system.” The information contained in the training materials provided in Module 6 of the North American Standard Level I- Part B (Vehicle) Inspection Course was updated in June 2007. It was also included in the Brake Check Card. In addition, FMCSA worked with the Heavy-Duty Brake Manufacturers Council (HDBMC) and the Insurance Corporation of British Columbia (ICBC) to develop a "Brake Check Card" for drivers and brake technicians. FMCSA has distributed some 34,000 of these cards, as well as 28 copies of the CD-ROM containing printable files to individuals and companies since November 2007. Recipients include brake suppliers, insurance companies, State commercial motor vehicle safety agencies through the CVSA, and others. The CVSA and our State partners alone distributed approximately 20,000 cards during the September 2008 Brake Safety Week. NTSB acknowledged this work and on August 10, 2010, classified Safety Recommendation H-06-002 as Open – Acceptable Alternative Response.

FMCSA also notes that the SAE International Truck and Bus Brake Actuator Committee has initiated work on a new SAE Recommended Practice, J2899, which would describe the physical characteristics of air brake actuators and define the maximum readjustment limits based on the rated stroke and type (size) of the chamber. The committee voted to develop this new J-specification to identify maximum readjustment limits independently of SAE J1817 and focus the latter on actuator long-stroke marking requirements. This project was initiated in May 2009, and it is not known

when the new recommended practice will be published. FMCSA believes that moving forward with these amendments at this time will ensure clear guidance is provided to motor carriers on the brake adjustment limits, and uniformity in the enforcement of those limits.

## **VI. Regulatory Analyses**

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

This final rule is not a significant regulatory action under section 3(f) of Executive Order 12866, Regulatory Planning and Review, as supplemented by Executive Order 13563, and does not require an assessment of potential costs and benefits under section 6(a)(3) of that Order. FMCSA expects the economic impact of this rule to be minimal. The proposal affects the conditions under which motor carriers are cited for out-of-adjustment brakes during roadside inspections and CMVs are placed OOS for such violations. Each brake adjustment violation cited during a roadside inspection must be addressed by the carrier, and each OOS order results in time lost for the carrier and driver because the vehicle may not be operated until the OOS defects have been corrected. Consequently, a decrease in OOS violations cited during roadside inspections can be considered a benefit of these proposed amendments to the readjustment limits because the decrease would represent vehicles that are currently being placed out of service that do not pose a significant safety risk. Conversely, any increase in violations and OOS orders would be a cost as the increase represents vehicles that would have been allowed to remain in operation but now will be considered a significant safety risk and removed from revenue service until the brake adjustment problems are resolved. With respect to

the safety impact of OOS orders for brake adjustment violations, more such orders on vehicles with defects may produce a safety benefit by reducing crashes. Neither the petitioners nor the Agency, however, are able to estimate whether the number of brake-adjustment violations resulting from this rule would increase or decrease by a significant amount. It should be noted, however, that FMCSA requires motor carriers to maintain their vehicles in safe and proper operating condition at all times and to have a systematic inspection, repair, and maintenance program to avoid dispatching CMVs with safety defects and deficiencies (see, e.g., 49 CFR 396.3(a)(1) and 398.7). Therefore, the potential costs of this rule relate only to carrying out the maintenance task (e.g., readjusting the brakes or replacing an inoperable slack adjuster) at the inspection location rather than at one of the carrier's usual maintenance locations.

From 2000 to 2011, the annual number of Level I and Level V roadside inspections of CMVs – the only inspection levels that include brake stroke measurement – ranged from about 0.94 to 1.25 million, and the percentage of inspections resulting in the CMV being placed OOS for brake violations of all kinds ranged from a high of 17 percent to a low of 12 percent. Roughly half of these violations concerned out-of-adjustment brakes, but the Agency believes that the changes in this final rule will have relatively little impact on this ratio. By (1) removing from § 393.47(e) the cross-reference to the readjustment-limits tables in SAE J1817 and the requirement that pushrod stroke be less than 80 percent of the rated stroke listed in those tables, (2) incorporating into § 393.47(e) a set of tables (duplicating those in Appendix G) providing explicit readjustment limits, and (3) requiring that pushrod stroke be not greater than the values specified in those tables, the rule eliminates certain discrepancies between the brake

readjustment values derived using the “80 percent of rated stroke” criterion under § 393.47(e) and the values specified in the SAE J1817 tables. In addition, these changes make Appendix G consistent with § 393.47(e), eliminating confusion in the enforcement community and the industry.

Although substituting the readjustment-limits tables for the cross-reference to SAE J1817 in § 393.47(e) resolves discrepancies that the cross-reference introduced, these differences are in many cases quite small. The differences vary according to the type (size) of brake chamber. Using the “80 percent of rated stroke” criterion may produce a value that is either more stringent or less stringent than the value specified in SAE J1817. For these reasons, FMCSA anticipates that certain brake pushrod stroke measurements that comply with the current rule could be out of compliance with the proposed standard – while the reverse could just as often be true. On the other hand, having the Appendix G amendment mirroring the § 393.47(e) requirement that pushrod stroke not be greater than the values specified in the readjustment-limits tables would have no effect on the rate of OOS violations related to brake stroke status – because roadside inspection procedures do not reference the readjustment limits in Appendix G.

In summary, although FMCSA is unable to estimate the net economic and safety impacts of the changes in this rule, the Agency believes these impacts will be minimal.

#### Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 et seq.) requires Federal agencies to determine whether proposed rules could have a significant economic impact on a substantial number of small entities. FMCSA estimates that the economic impact of this

rule will be minimal. Consequently, I certify that this proposed action would not have a significant economic impact on a substantial number of small entities.

Unfunded Mandates Reform Act of 1995

This rulemaking does not impose an unfunded Federal mandate, as defined by the Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1532 et seq.), that will result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$141.3 million (which is the value of \$100 million in 2010 after adjusting for inflation) or more in any 1 year.

Executive Order 12988 (Civil Justice Reform)

This proposed action meets applicable standards in sections 3(a) and 3(b)(2) of Executive Order 12988, Civil Justice Reform, to minimize litigation, eliminate ambiguity, and reduce burden.

Executive Order 13045 (Protection of Children)

FMCSA analyzed this action under Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. The Agency determined that this rulemaking does not pose an environmental risk to health or safety that may disproportionately affect children.

Executive Order 12630 (Taking of Private Property)

This rulemaking does not effect a taking of private property or otherwise have takings implications under Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights.

Executive Order 13132 (Federalism)

A rulemaking has implications for Federalism under Executive Order 13132, Federalism, if it has a substantial direct effect on State or local governments and would either preempt State law or impose a substantial direct cost of compliance on them. FMCSA analyzed this action in accordance with Executive Order 13132. The rule does not have a substantial direct effect on States, nor does it limit the policymaking discretion of States. Nothing in this rulemaking preempts any State law or regulation.

Executive Order 12372 (Intergovernmental Review)

The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities do not apply to this action.

Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) requires that FMCSA consider the impact of paperwork and other information collection burdens imposed on the public. The Agency has determined that this rule imposes no new information collection requirements.

National Environmental Policy Act

FMCSA analyzed this rule for the purpose of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) and determined under our environmental procedures Order 5610.1, published in the Federal Register on March 1, 2004 (69 FR 9680), that this action does not have any effect on the quality of the environment. Therefore, this rule is categorically excluded from further analysis and documentation in an environmental assessment or environmental impact statement under FMCSA Order 5610.1, paragraph 6(bb) of Appendix 2. The Categorical Exclusion under paragraph 6(bb) relates to

“regulations concerning vehicle operation safety standards,” such as the amended brake inspection standards adopted in this rulemaking. A Categorical Exclusion determination is available for inspection or copying in the [Regulations.gov](http://www.Regulations.gov) Web site listed under

#### **ADDRESSES.**

FMCSA also analyzed this rule under section 176(c) of the Clean Air Act (CAA), as amended (42 U.S.C. 7401 et seq.), and implementing regulations promulgated by the Environmental Protection Agency. Approval of this action is exempt from the CAA’s general conformity requirement since it does not affect direct or indirect emissions of criteria pollutants.

#### Executive Order 13211 (Energy Effects)

FMCSA analyzed this action under Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use. The Agency has determined that it is not a “significant energy action” under that Executive Order because it is not economically significant and is not likely to have an adverse effect on the supply, distribution, or use of energy.

#### **List of Subjects in 49 CFR Part 393**

Highways and roads, Incorporation by reference, Motor carriers, Motor vehicle equipment, Motor vehicle safety.

In consideration of the foregoing, FMCSA amends title 49, Code of Federal Regulations, subtitle B, chapter III, as follows:

#### **PART 393 [AMENDED]**

1. The authority citation for part 393 is revised to read as follows:

Authority: 49 U.S.C. 31136, 31151, and 31502; Sec. 1041(b) of Pub. L. 102-240, 105 Stat. 1914, 1993 (1991); and 49 CFR 1.73.

2. In § 393.7, remove and reserve paragraph (b)(15).

3. Amend § 393.47 by revising paragraph (e) to read as follows:

§ 393.47 Brake actuators, slack adjusters, linings/pads, and drums/rotors.

\* \* \* \* \*

(e) Clamp, Bendix DD-3, bolt-type, and rotochamber brake actuator readjustment

limits. (1) The pushrod stroke must not be greater than the values specified in the following tables:

**Clamp-Type Brake Chambers:**

Type	Outside Diameter	Brake Readjustment Limit: Standard Stroke Chamber	Brake Readjustment Limit: Long Stroke Chamber
6	4 1/2 in. (114 mm)	1 1/4 in. (31.8 mm)	--
9	5 1/4 in. (133 mm)	1 3/8 in. (34.9 mm)	--
12	5 11/16 in. (145 mm)	1 3/8 in. (34.9 mm)	1 3/4 in. (44.5 mm)
16	6 3/8 in. (162 mm)	1 3/4 in. (44.5 mm)	2 in. (50.8 mm)
20	6 25/32 in. (172 mm)	1 3/4 in. (44.5 mm)	2 in. (50.8 mm) 2 1/2 in. (63.5 mm) <sup>1</sup>
24	7 7/32 in. (184 mm)	1 3/4 in. (44.5 mm)	2 in. (50.8 mm) 2 1/2 in. (63.5 mm) <sup>2</sup>
30	8 3/32 in. (206 mm)	2 in. (50.8 mm)	2 1/2 in. (63.5 mm)
36	9 in. (229 mm)	2 1/4 in. (57.2 mm)	--

<sup>1</sup> For type 20 chambers with a 3-inch (76 mm) rated stroke

<sup>2</sup> For type 24 chambers with a 3-inch (76 mm) rated stroke

**Bendix DD-3 Brake Chambers:**

Type	Outside Diameter	Brake Readjustment Limit
30	8 1/8 in. (206 mm)	2 1/4 in. (57.2 mm)

**Bolt-Type Brake Chambers:**

Type	Outside Diameter	Brake Readjustment Limit
A	6 15/16 in. (176 mm)	1 3/8 in. (34.9 mm)
B	9 3/16 in. (234 mm)	1 3/4 in. (44.5 mm)
C	8 1/16 in. (205 mm)	1 3/4 in. (44.5 mm)
D	5 1/4 in. (133 mm)	1 1/4 in. (31.8 mm)
E	6 3/16 in. (157 mm)	1 3/8 in. (34.9 mm)
F	11 in. (279 mm)	2 1/4 in. (57.2 mm)
G	9 7/8 in. (251 mm)	2 in. (50.8 mm)

**Rotochamber-Type Brake Chambers:**

Type	Outside Diameter	Brake Readjustment Limit
9	4 9/32 in. (109 mm)	1 1/2 in. (38.1 mm)
12	4 13/16 in. (122 mm)	1 1/2 in. (38.1 mm)
16	5 13/32 in. (138 mm)	2 in. (50.8 mm)
20	5 15/16 in. (151 mm)	2 in. (50.8 mm)
24	6 13/32 in. (163 mm)	2 in. (50.8 mm)
30	7 1/16 in. (180 mm)	2 1/4 in. (57.2 mm)
36	7 5/8 in. (194 mm)	2 3/4 in. (69.9 mm)
50	8 7/8 in. (226 mm)	3 in. (76.2 mm)

(2) For actuator types not listed in these tables, the pushrod stroke must not be greater than 80 percent of the rated stroke marked on the actuator by the actuator manufacturer, or greater than the readjustment limit marked on the actuator by the actuator manufacturer.

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4. Amend § 393.53 by revising paragraphs (b) and (c) to read as follows:

§ 393.53 Automatic brake adjusters and brake adjustment indicators.

\* \* \* \* \*

(b) Automatic brake adjusters (air brake systems). Each commercial motor vehicle manufactured on or after October 20, 1994, and equipped with an air brake system must meet the automatic brake adjustment system requirements of Federal Motor Vehicle Safety Standard No. 121 (49 CFR 571.121, S5.1.8 or S5.2.2) applicable to the vehicle at the time it was manufactured.

(c) Brake adjustment indicator (air brake systems). On each commercial motor vehicle manufactured on or after October 20, 1994, and equipped with an air brake system which contains an external automatic adjustment mechanism and an exposed pushrod, the condition of service brake under-adjustment must be displayed by a brake adjustment indicator conforming to the requirements of Federal Motor Vehicle Safety Standard No. 121 (49 CFR 571.121, S5.1.8 or S5.2.2) applicable to the vehicle at the time it was manufactured.

5. Amend Appendix G to Subchapter B by revising paragraph 1.a(5) to read as follows:

Appendix G to Subchapter B of Chapter III—Minimum Periodic Inspection Standards

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1 \* \* \*

a. \* \* \*

(5) Readjustment limits. (a) The maximum pushrod stroke must not be greater than the values given in the tables below and at § 393.47(e). Any brake stroke exceeding the readjustment limit will be rejected. Stroke must be measured with engine off and reservoir pressure of 80 to 90 psi with brakes fully applied.

**Clamp-Type Brake Chambers:**

Type	Outside Diameter	Brake Readjustment Limit: Standard Stroke Chamber	Brake Readjustment Limit: Long Stroke Chamber
6	4 1/2 in. (114 mm)	1 1/4 in. (31.8 mm)	--
9	5 1/4 in. (133 mm)	1 3/8 in. (34.9 mm)	--
12	5 11/16 in. (145 mm)	1 3/8 in. (34.9 mm)	1 3/4 in. (44.5 mm)
16	6 3/8 in. (162 mm)	1 3/4 in. (44.5 mm)	2 in. (50.8 mm)
20	6 25/32 in. (172 mm)	1 3/4 in. (44.5 mm)	2 in. (50.8 mm) 2 1/2 in. (63.5 mm) <sup>1</sup>
24	7 7/32 in. (184 mm)	1 3/4 in. (44.5 mm)	2 in. (50.8 mm)

			2 1/2 in. (63.5 mm) <sup>2</sup>
30	8 3/32 in. (206 mm)	2 in. (50.8 mm)	2 1/2 in. (63.5 mm)
36	9 in. (229 mm)	2 1/4 in. (57.2 mm)	--

<sup>1</sup> For type 20 chambers with a 3-inch (76 mm) rated stroke

<sup>2</sup> For type 24 chambers with a 3-inch (76 mm) rated stroke

**Bendix DD-3 Brake Chambers:**

Type	Outside Diameter	Brake Readjustment Limit
30	8 1/8 in. (206 mm)	2 1/4 in. (57.2 mm)

**Bolt-Type Brake Chambers:**

Type	Outside Diameter	Brake Readjustment Limit
A	6 15/16 in. (176 mm)	1 3/8 in. (34.9 mm)
B	9 3/16 in. (234 mm)	1 3/4 in. (44.5mm)
C	8 1/16 in. (205 mm)	1 3/4 in. (44.5 mm)
D	5 1/4 in. (133 mm)	1 1/4 in. (31.8 mm)
E	6 3/16 in. (157 mm)	1 3/8 in. (34.9 mm)
F	11 in. (279 mm)	2 1/4 in. (57.2 mm)
G	9 7/8 in. (251 mm)	2 in. (50.8 mm)

**Rotochamber-Type Brake Chambers:**

<b>Type</b>	<b>Outside Diameter</b>	<b>Brake Readjustment Limit</b>
9	4 9/32 in. (109 mm)	1 1/2 in. (38.1 mm)
12	4 13/16 in. (122 mm)	1 1/2 in. (38.1 mm)
16	5 13/32 in. (138 mm)	2 in. (50.8 mm)
20	5 15/16 in. (151 mm)	2 in. (50.8 mm)
24	6 13/32 in. (163 mm)	2 in. (50.8 mm)
30	7 1/16 in. (180 mm)	2 1/4 in. (57.2 mm)
36	7 5/8 in. (194 mm)	2 3/4 in. (69.9 mm)
50	8 7/8 in. (226 mm)	3 in. (76.2 mm)

(b) For actuator types not listed in these tables, the pushrod stroke must not be greater than 80 percent of the rated stroke marked on the actuator by the actuator manufacturer, or greater than the readjustment limit marked on the actuator by the actuator manufacturer.

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William Bronrott  
Deputy Administrator

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