U.S. Department
of Transportation

**Federal Railroad
Administration**

Motive Power and Equipment Enforcement Manual

Office of Safety

July 1992

FEDERAL RAILROAD ADMINISTRATION

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Federal Railroad Administration
Motive Power and Equipment Division
RRS-14
400 Seventh Street S.W.
Washington D.C. 20590

July 1, 1992

TO THE USER
OF THE
MOTIVE POWER AND EQUIPMENT
ENFORCEMENT MANUAL

The Motive Power and Equipment Enforcement Manual is written to help Inspectors do their jobs. The Manual includes the regulations which set safety standards for inspections, tests, maintenance, and operation of power and equipment rolling stock units by railroads. These regulations are published in the 49 Code of Federal Regulations Parts 200 to 399. In addition, the Manual includes enforcement and inspection strategies to be used by Federal and State Motive Power and Equipment Inspectors, interpretations of the codified regulations and defect codes to be used to record noncomplying conditions.

The aim of the Manual is to furnish clear, uniform and necessary instructions which must be used by Federal and State Inspectors to observe tests, to perform inspections and investigations which may lead to enforcement action.

Inspectors should use the Manual as an aid to gain a thorough knowledge and understanding of the regulations governing safety of motive power and equipment rolling stock. However, knowledge and understanding of the regulations alone is not adequate to be a good Inspector. Inspectors are the FRA point men. The success and effectiveness of FRA safety enforcement programs hinge on the ability of Inspectors to use good judgement in how to achieve compliance with the regulations. Inspectors have considerable enforcement discretion. This Manual should be used as a guide in how to exercise that discretion. If the Manual does not provide adequate guidance for a particular situation, the Inspector is urged to seek the assistance of their regional supervisor.

Any questions about information or interpretations contained in this Manual should be referred to RRS-14 for prompt response. Suggested improvements or corrections to the Manual are solicited and should be submitted on the attached form with appropriate copies to regional supervisors.

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MOTIVE POWER AND EQUIPMENT ENFORCEMENT MANUAL

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General

Introduction

This manual prescribes the manner in which Federal and State Motive Power & Equipment Inspectors (MP&E) shall engage in inspection, investigative and surveillance activities to assure compliance with Federal rules, regulations, orders and standards issued by the Federal Railroad Administrator, and such other activities as may be assigned.

The directives in this manual are designed to assure maximum effective use of available resources. Compliance with these directives will result in the uniform application and enforcement of federal safety regulations throughout the nation. This uniformity is necessary for effective program management and is mandated by the Federal Railroad Safety Act of 1970 (P.L. 91-458).

Both Federal and State Inspectors engaged in motive power and equipment investigation activities should refer to this manual as often as necessary to obtain a clear understanding of their roles in the implementation of the MP&E safety standards. If there is any doubt as to the meaning of any information in this manual, an Inspector should contact his/her Supervisory Railroad Safety Specialist for an explanation.

Discussions of the safety standards in this manual give a strict interpretation of specific sections. However, they should not be construed as a modification, alteration or revision of the published standards.

This manual contains directives ranging from general to specific. It is the property of the Federal Railroad Administration and intended for use by FRA personnel only.

- Chapter 1 Describes FRA's program goal, the basis for regulation and inspection, responsibilities of motive power and equipment personnel, and other important directives.
- Chapter 2 Describes the general procedures used during inspections and investigations.
- Chapter 3 Describes the categories of inspection and investigations.
- Chapter 4 Describes the enforcement options available to the inspector.

- Chapter 5 Describes field reporting procedures and forms.
- Chapter 6 Gives Railroad Freight Car Safety Standards.
- Chapter 7 Describes Railroad Operating Practices (Blue Signal).
- Chapter 8 Gives Railroad Locomotive Safety Standards.
- Chapter 9 Describes Rear End Marking Device-Passenger, Commuter and Freight Trains.
- Chapter 10 Gives Procedures for Locomotive Inspection (Steam).
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Program Goals

The goal of the Motive Power & Equipment inspection program is to administer an effective safety program and achieve safe operating and mechanical practices in the railroad industry, through enforcement of all Federal laws and regulations designed to promote railroad safety as it relates to employees, passengers and the general public.

Basis for Regulation and Inspection

Statutory Authority

The Safety Appliance Acts - 45 U.S.C. $$ 1-14, 16
Require the use and maintenance of specific appliances on railcars to protect railroad employees, especially those involved in switching operations, and include provisions concerning power brakes. Implementing regulations: 49 CFR Parts 231 and 232.

The Locomotive Inspection Act - 45 U.S.C $$ 22-34
Prohibits the use of unsafe locomotives and authorizes FRA to issue standards for maintenance and testing. Implementing regulation: CFR Parts 229 and 230.

Noise Control Act of 1972 - 42 U.S.C. $ 4901 et seq.
Authorizes EPA to establish Federal noise emission standards for products distributed in commerce.

Federal Railroad Safety Act of 1970 - 45 U.S.C. $$ 421, 431-441
Besides the earlier laws described, the Federal Railroad Safety Act of 1970 contains authority to establish a safety regulatory program. Section 202 of the Act provides for the Secretary of Transportation (delegated to the Federal Railroad Administrator)

to prescribe, as necessary, appropriate rules, regulations, orders and standards in all areas of railroads safety supplementing provisions of law and regulations in effect on the date of enactment of this title. Implementing regulations: 49 CFR Parts 209,211-213, 215-221, 223, 225, 228-236, 240.

The Act also provides authority for the State Participation Program, penalties for failure to comply with a safety regulation or rule, and for examination of railroad property and records.

Besides civil penalties, other extraordinary compliance provisions are expressly provided for in Section 203 of the Act. An Emergency Order may be issued by the Federal Railroad Administrator when testing, inspection, investigations, or research has determined an unsafe condition exists creating an immediate hazard of death or injury to railroad personnel and the general public. A Compliance Order or Special Notice of Repair can also be invoked when circumstances warrant. This manual provides guidance to inspectors on the use of these extraordinary remedies.

Rail Safety Improvement Act of 1988 - Public Law 100-342
Includes important amendments made to existing railroad safety laws. Created individual liability for violations and authorized FRA to bar individuals from performing safety sensitive service. Increased the maximum civil penalty to $10,000 for violation of FRA regulations, or to a maximum of $20,000 in grossly negligent violations or patterns of repeated violations creating imminent hazard of death or injury. Clarified and expanded FRA's jurisdiction.

Railroad Safety Regulations - Motive Power and Equipment

Railroad Noise Emission Compliance Rules
Implementing regulation: 49 CFR Part 210

This part prescribes enforcement regulations for compliance with the Railroad Noise Emission Standards established by the Environmental Protection Agency in 40 CFR Part 20.

Railroad Freight Car Safety Standards
Implementing regulation: 49 CFR Part 215

This part prescribes minimum Federal safety standards for railroad freight cars, lists restricted cars and/or components, and prescribes inspection requirements for freight car components. The standards became effective January 12, 1974 and were revised in 1979.

Federal Railroad Administration

Railroad Operating Practices - Blue Signal Protection
Implementing Regulation: 49 CFR Part 218, Subpart B

This part prescribes minimum requirements for the protection of railroad employees engaged in the inspection, testing, repair, and servicing of rolling equipment whose activities require them to work on, under, or between such equipment and subjects them to the danger of personal injury posed by any movement of such equipment.

Rear End Marking Device
Implementing Regulation: 49 CFR Part 221

This part prescribes minimum requirements governing highly visible marking devices for the trailing end of the rear car of all passenger, commuter and freight trains.

Safety Glazing Standards - Locomotives, Passenger Cars and Cabooses
Implementing Regulation: 49 CFR Part 223

This part provides minimum requirements for glazing materials to protect railroad employees and railroad passengers from injury as a result of objects striking the windows of locomotives, cabooses, and passenger cars.

Railroad Locomotive Safety Standards and Locomotive Inspection
Implementing Regulations: 49 CFR Parts 229 and 230

These regulations require locomotives and their appurtenances (1) to be in proper condition and safe to operate in the service to which they are put, without unnecessary peril to life or limb; and (2) to be inspected and tested as required by Part 229.

Railroads are required to perform periodic maintenance and inspection at stated intervals and maintain records of the maintenance and inspections.

Accidents resulting from failure of a locomotive or any part or appurtenances, resulting in the serious injury or death of one or more persons, must be reported immediately reported by the railroad operating the locomotive.

Railroad Safety Appliance Standards
Implementing Regulation: 49 CFR Part 231

Locomotives and trains require power brakes so brakemen will not be required to use the hand brake to control the speed of trains.

Cars must be equipped with semi-automatic type couplers so they can be coupled automatically by impact or uncoupled without the need for employees going between cars.

Cars must be equipped with secure handholds on their sides and ends for use during coupling and uncoupling. Cars of certain types must be equipped with secure ladders, running boards and roof handholds. Each car must have an efficient hand brake.

Railroad Power Brakes and Drawbars
Implementing Regulation: 49 CFR Part 232

This regulation prescribes rules, standards and instructions for the installation, inspection, maintenance and repair of all power or train brakes including end of train devices.

Definitions

Specialist: As used hereafter in this manual refers to Supervisor Railroad Safety Specialists (MP&E). The Specialist is responsible for technical evaluation of all motive power and equipment activities within the region and provides technical guidance and advice in these areas.

Inspector: As used hereafter in this manual refers to a Federal Motive Power & Equipment Inspector (MP&E) or a State Equipment Inspector.

State Equipment Inspector: As used hereafter in this manual refers to a Qualified State Car Inspector, Qualified State Locomotive Inspector, or Qualified State MP&E Inspector who has been trained, examined, and recognized by the Federal Railroad Administration to make equipment inspections in a state permitted by regulation to participate in enforcement by agreement or certification.

Responsibilities of Motive Power & Equipment Personnel

Specialist: The MP&E Specialist is responsible for technical evaluation of all motive power and equipment activities within the region and provides technical guidance and advice in these areas. The Specialist evaluates the allocation of inspection resources within the region, commensurate with the risks of materials transported, density of operations involved, and geographical territorial limitations, and assigns Motive Power & Equipment Inspectors accordingly, to ensure appropriate inspection coverage.

Motive Power & Equipment Inspector: Inspects railroad equipment in an assigned territory with responsibility for the improvement and advancement of railroad safety in

areas related to design, construction, inspection, maintenance and use of railroad rolling stock and related appurtenances. In this capacity the inspector:

- Plans and carries out an itinerary of periodic inspections that provide maximum coverage of the railroad cars and locomotives in the territory where the incumbent is responsible for impartial and uniform application of the laws, rules, regulations, orders and standards pertaining to motive power and equipment;

- Inspects and observes tests of railroad rolling stock, including motive power, other on-track equipment, and related appurtenances to determine compliance with applicable laws, rules, regulations, orders and standards. Prior to or during assembly and installation, inspects and observes tests and component parts of railroad facilities to determine whether such parts are suitable for the intended service;

- Reviews existing and proposed motive power and equipment designs, construction, operations, maintenance and repair methods to ensure compliance with applicable laws, regulations, standards, rules and orders;

- Makes inspections and observations to determine the condition and operation of motive power and equipment. Conducts investigation's of collisions, reportable derailments, or other accidents resulting in serious injury to person(s) or to the property of a railroad occurring on the line of any common carrier engaged in interstate or foreign commerce by rail. Determines probable cause of accident or incident and if Federal regulations were violated. Develops comprehensive reports that outline findings and recommendations. Investigates complaints alleging unsafe conditions or non-compliance with motive power and equipment, safety appliance and power brake laws. When an unsafe condition or non-compliance with applicable safety laws, regulations, etc., is found, appropriate corrective action is taken directly with the carrier to obtain compliance. Incumbent initiates prosecutions and obtains evidence to support such prosecutions;

- Maintains familiarity with motive power and equipment conditions in an assigned territory. Confers with division and general officers of the carriers, shippers, labor organizations, State Public Service Commissions and others to promote cooperation in the improvement of railroad safety and to have intimate knowledge of conditions in his/her assigned territory relating to motive power and equipment and compliance with laws, regulations, etc., pertaining thereto. Receives training in the inspection of new types of air brakes, locomotives and railroad cars, as necessary.

- Maintains awareness of railroad safety activities of States within his/her territory to keep informed of any State regulations that are additional to, or more stringent than, a Federal Law, regulation, order or standard applicable to motive power and equipment. Works with and instructs State Inspectors involved in the enforcement of the FRA regulations under the State Participation programs within his/her assigned territory. Interprets new regulations for railroad officials, employees of carriers, and unions.

- Reviews, evaluates, and recommends approval or rejection of railroad petitions for waiver from major portions of Federal safety regulations.

- Participates in special studies and projects as assigned by the region.

- Inspects steam locomotives when qualified to do so.

Credentials

Inspectors must have their credentials on their person while on duty. Any request to provide identification should be complied with in a prompt and courteous manner.

Personal Safety

The Inspector's first concern is safety. Inspectors should remain alert to the dangers of moving equipment and third rail/electrified equipment.

The inspector must comply with the railroad's request to use safety equipment such as hard hats, safety shoes, safety glasses, etc.

Regional Inspection Point List

Each Inspector must prepare a Regional Inspection Point List for his/her inspection territory, and periodically submit necessary corrections to ensure that the list is always current. Refer to the current Regional Inspection Point List instructions for additional information.

Technical Bulletins

The Office of Safety periodically issues Technical Bulletins (TB's) to provide instructions and guidance on a variety of general and discipline oriented issues. TB's 0 - 99 are

general in nature; the 100 series addresses MP&E practices.

MP&E Inspectors must maintain a current file of all general and MP&E related TB's and it must be readily available to them.

Subpoenas

If subpoenaed or otherwise notified to appear as a witness in any court proceeding, including personal matters, Inspectors must immediately notify the Region Office and provide information as to date, place and time of the subpoena serving; title of case; party by whom subpoenaed; name and address of that party's attorney; name of court; place, date and time of trial, and circumstances of the incident for which subpoenaed.

Delaying Trains or Other Railroad Operations

FRA Inspectors have no authority to prohibit the departure or movement of any train, locomotive, car, etc.. However, Inspectors should promptly point out hazardous conditions that could result in an accident if the train departs.

Contacts With News Media

Inspectors are not authorized to grant interviews to representatives of the news media. If approached by news media personnel, during accident investigations, Inspectors should refer such personnel to the FRA, Office of Public Affairs, (202) 366-0881. **Inspectors must not provide the news media with information as to probable cause.**

Requests for information, made under the Freedom of Information Act, should be forwarded to the FRA, Office of Chief Council.

National Transportation Safety Board

The "Independent Safety Board Act of 1974", established the National Transportation Safety Board (NTSB) as an independent agency. The NTSB is authorized to investigate railroad accidents, and to make recommendations based upon their investigation. If during an accident investigation, NTSB Investigators arrive on the scene, FRA Inspectors should introduce himself/herself and promptly contact the Region Office and advise of NTSB's presence. However, unless instructed otherwise, FRA investigation activities should continue.

It is the Office of Safety's policy to extend full cooperation to the Safety Board in all

matters related to railroad safety. If an Inspector is assigned to assist in an NTSB accident investigation, the Inspector must keep the Regional Director informed about the progress of the Board's investigation.

Chapter 2

Inspection and Investigation Procedures

Allocation of Resources

Every railroad or person affecting rail transportation is subject to inspection to determine compliance with the underlying statues and regulations. The Supervisory Specialist is responsible for coordinating the motive power and equipment activities and assignments within the Region. The Specialist will also determine if particular attention is needed at one or more high-risk railroads. FRA shall base its determination if a railroad is a high-risk on the following data elements:

- Accident/incident information
- Number of defects and violations
- Number of injuries and fatalities
- Car movements
- Train movements
- Total train-mile operations

With this information, historical data may be interpreted to define high-risk entities. The previous years activities, for a given Inspector or region, are quantified for the up-coming year by the Office of Safety. With this data, the Office of Safety prepares written policy guidance for each discipline on the types and locations of needed inspections. To ensure a uniform National inspection effort, personnel in each region shall refer to the National Inspection Plan for guidance in the allocation of inspection resources.

Inspector Activity Priorities

The allocation of resources will often deviate from the desired goal because of unforseen events. When these events occur, Regional Directors, Specialist and Inspectors will base their decisions on the following priorities:

- Accident/incident investigations
- Congressional complaint investigations

- Special Assessments
- Complaint investigations
- Special Investigations (Sample car, steam locomotive, OSHA, etc.)
- Regular inspections

Duty Hours - Routine Inspections and Investigations

MP&E inspections and investigations will be conducted during the inspector's normally assigned office hours. On certain occasions, inspectors will conduct inspections, investigations, or surveillance activities outside of the established office hours. When an inspection occurs outside of the inspector's normally assigned office hours, the inspector should notify his/her Supervisory Specialist.

Under no circumstances shall an inspector work outside the assigned normal work day without prior authorization from the Regional Director or Specialist.

Operation of Railroad Equipment

Inspectors are not authorized to operate any equipment, device, or perform any test of railroad equipment. If necessary, for purposes of an inspection or investigation, a railroad representative must be requested to perform such procedures.

Unusual Occurrences

Signing Release of Liability

Inspectors should not, sign any documents releasing the railroad from liability due to personal injury, loss or damage to property. Inspectors may, when requested, sign a visitor or guest register used to control entry to railroad property, provided such document does not constitute any form of release or waiver of liability.

Refusal To Permit Inspection or Investigation

If a railroad representative refuses to permit inspection or investigation activity, good judgement and professionalism should prevail. Attempt to determine the reason for refusal. If a brief, courteous discussion with the railroad representative does not resolve the issue, Inspectors should leave the railroad property and immediately advise their Regional office of the situation. **Under no circumstances should Inspectors engage in debate or argument with a railroad representative.**

Strikes and Labor Disputes

Inspectors should not enter railroad property that is subject to a strike, picket lines, or work stoppage without consulting the Regional Office. If, after consultation, the decision is made to conduct inspection/investigation activity and such activity requires the passing of picket lines, Inspectors should identify themselves as an FRA Inspector, display their credentials and state the purpose of the inspection. If the Inspector is met with resistance or threats of bodily harm, withdraw from the scene and promptly report the incident to the Regional Office.

Cooperation of FRA Personnel with Industry and Other Governmental Agencies

The Inspector should maintain a cordial relationship with the railroads, manufacturers of railroad rolling equipment, and other public or governmental agencies. The Regional Director or his representative must authorize the Inspector to provide assistance to governmental, public, and industry agencies including cooperation or help on any project or investigation.

Chapter 3

Compliance Program

Regular Inspections

Motive Power & Equipment Inspectors are not required to provide advance notice of an inspection, follow-up inspection, investigation, or surveillance activity. However, advance notice may be given when considered necessary to ensure the availability of records, equipment, carrier representative, or persons to be interviewed.

Inspectors have no authority to prohibit the departure or movement of any train, locomotive, car, etc. However, Inspectors should promptly point out hazardous conditions that could result in an accident if the train departs before correcting that condition.

Follow-up inspections shall be made to confirm repair of defective conditions. The frequency of follow-up inspections can be determined by many factors and may include the following;

- Quantity of defective equipment at a given location
- Equipment/defect ratio
- Knowledge or suspicion that repairs are not properly executed
- Low supply or lack of inventory of replacement material
- Work force/defective equipment ratio

Upon completion of an inspection, which may not be until the equipment departs, the Inspector shall confer with a railroad representative to advise him/her of any condition or practice revealed by the inspection that may result in a safety violation. If time permits, a written report(s) will be given to a railroad representative before the inspector leaves the railroad's property. If a railroad representative is not present or the Inspector does not have sufficient time to complete a written report then one will be completed during the next work period and delivered or forwarded to the railroad.

When conducting an inspection at a remote location, where no railroad representative is available, the railroad must be contacted by telephone at the completion of the inspection and advised of the results, even if exceptions were not noted.

The railroad must be provided a copy of the report(s), even if a defective condition(s) was not found.

Investigations

Accident/Incident

The Inspectors top priority at an accident scene is safety.

The Federal Railroad Administration has an accident team at headquarters on duty seven days a week, twenty four hours a day, every day of the year, to receive accident information.

Accident investigation assignments may be initiated by either the Reports Branch, the Director of the Office of Safety Enforcement, or Regional Directors.

Accidents routinely investigated by the FRA Office of Safety are:

- A train collision or derailment resulting in fatal injury to a person or serious injury to one or more persons.
- A highway-rail grade crossing collision resulting in death to one or more persons in a vehicle such as a commercial vehicle or a school bus; serious injury to several persons in such a vehicle; death to two or more persons in a vehicle such as a private automobile.
- A train accident resulting in imperilment of a community due to fire, explosion, or release of toxic substances, or to the threat thereof.
- A non-casualty train accident resulting in derailment of a locomotive and/or large number of cars, extensive property damage, etc.
- A train accident resulting in fire, explosion, or release of classified hazardous materials.
- A accident/incident whose investigation would substantially serve to promote railroad safety.
- A railroad related accident resulting in a death to a railroad employee, regardless of craft.

- An accident due to a failure from any cause of a locomotive or any part or appurtenance of a locomotive, or a person coming in contact with an electrically energized part or appurtenance that results in serious injury or death of one or more persons. Also any accident with a locomotive other than a control cab locomotive that does not have any traction device supplying tractive power (See 49 C.F.R. 229.17 and 229.5(l)).

- Any other train accident/incident likely to arouse considerable public interest.

Establishing communication links with regional coordinators and Headquarters' specialists (RRS-22.2), who collect and disseminate accident information, is crucial. Promptly after investigators arrive on the scene, preliminary details should be communicated orally in the Railroad Accident Notification format (Form F 6180-41). Additional information updates should be provided until conditions stabilize and the full extent of the accident is known. If investigators are a great distance from the scene and there will be considerable delay (more than two hours) before arriving, contact local authorities by telephone and gather information about hazardous materials involved, evacuations, injuries and the extent of the damages.

When responding to an accident investigation, Inspectors shall identify themselves to:

- On-scene coordinator

- Other state and local emergency response personnel

- State and local authorities and/or representatives

- Representatives from the Federal Government (i.e., NTSB, EPA, etc.)

- Railroad representatives

The Inspector should also inform the On-Scene Coordinator of the technical resources available for guidance in assessing commodity hazards and rail equipment damage and for handling wreckage clearing operations. These resources may include:

Emergency Assistance:

- Chemtrec 24 hours 800-424-9300
  - Chemnet
  - Chlorep
  - NACA Pesticide Safety Team
  - Shipper Contacts

Federal Railroad Administration

- Bureau of Explosives 24 hours 202-639-2222
- Poison Control Center
- Clean-up Contractors

National Federal Assistance:

- National Response Center 24 hours 800-424-8802
- FEMA 24 hours 202-646-2400
- ATSDR 24 hours 404-452-4100
- Nuclear Regulatory Commission 24 hours 301-951-0550

Inspectors should give no advice on the handling of damaged rail cars or emergency response procedures; however, the Inspector may warn the On-Scene Coordinator if, in the Inspector's judgement, an imminent hazard exists.

While conducting the investigation obtain a copy of the train consist and a shipping paper for each hazardous material shipment. In addition, the inspector shall describe or record separately the following that applies:

- Sketch of the accident scene - including:
  - Equipment number(s) and relative position after accident
  - Placard and DOT number
  - Right-of-way(i.e., curves, crossovers, siding, etc.)
  - Photographs
  - Encompass as wide of a range as obstacles will allow
  - Take close-up photos where detail is required
  - Name and title of involved carrier employees

- Probable cause, if known

Complaints

Motive Power & Equipment complaints received in the Washington office will be assigned a control number before transmission to the region for investigation. Once received by the region, the Inspector will complete the investigation within the generally assigned completion date:

- 10 days for Congressional complaints
- 60 days for all others

If a complaint investigation cannot be completed by the assigned date the Inspector will write a memorandum to the Region Office explaining the reason(s) for the delay. Each five days thereafter, until completion of the complaint, the Inspector will submit a memorandum to the Region Office explaining the status of the complaint.

Generally, complaints are filed by employees, labor organizations and the general public. The Inspector assigned to a complaint investigation normally knows the identity of the complainant and the names of potentially helpful contacts. An inspector may not, under any circumstance, reveal the identity of the complainant to anyone not employed by the FRA, unless;

- The complainant authorizes such disclosure in writing
- The disclosure is to the Department of Justice concerning related litigation
- A court of competent jurisdiction(as determined by consultation with counsel for FRA) requires the disclosure. See § 5 of the Railroad Safety Improvement Act of 1988, 45 U.S.C. § 441(f).

An Inspector assigned to investigate a complaint should determine the facts of the case, report the findings, and provide analysis. This will be done without revealing to any person that a complaint is or was under investigation.

Waiver Petition

Motive Power & Equipment waivers received in the Washington office will be assigned a control number before transmission to the region for investigation. Once received, the Inspector will complete the waiver petition investigation in a timely manner and submit a memorandum including his/her recommendation to the Region Office. If the waiver

petition investigation requires more than thirty days to complete the Inspector will submit a memorandum to the Region Office detailing the delay.

Sample Car Inspections

Sample car inspections are performed to insure that new cars are built in accordance with all applicable regulations.

Headquarters will advise the appropriate Regional Office as to the time, date, and location of a scheduled sample car inspections. Regional Directors will appoint a Sample Car Inspection Team of Specialists and experienced Inspectors to perform these inspections.

The Team assigned to a sample car inspection shall review in advance the current MP&E Sample Car Inspection Procedure Guidelines, pertinent regulations covering the type of car to be inspected and the current Association of American Railroads (AAR) rules. Inspectors should have necessary equipment to perform the inspection(i.e., appropriate regulations, gauges, camera, ruler or measuring devices).

The sample car shall be examined from a standpoint of overall operational safety and should include conditions not covered by regulations. Photograph and describe in detail any condition detrimental to safety, or that may over time become detrimental to safety.

The car must comply with the applicable sections of:

- 49 CFR Part 215 - Railroad Freight Car Safety Standards
- 49 CFR Part 231 - Railroad Safety Appliance Standards
- 49 CFR Part 232 - Railroad Power Brakes and Drawbars

Also, the car should comply with AAR's Manual of Standards and Recommended Practices:

- S-400 - Freight Car Brake Equipment Installation, Specification No. 2518
- S-401 - Freight Car Brake Design Requirements (golden shoe test)

Potential unsafe conditions must be identified when possible and corrected during the inspection.

An FRA Form F 6180.4, Special Inspection of Safety Appliance Equipment, will be

completed for each type of equipment inspected. Normally a sample car inspection does not require an FRA F 6180.59 report.

Each applicable block of the F 6180.4 will be completed. Enter "N/A" in spaces that do not apply. If an appliance deviates from the standards, enter the dimensions or description in the appropriate space on the front of the form. Any deviation from FRA regulations and/or AAR specifications must be documented on the F 6180.4 report and reported to the builder's representative for corrective action. If necessary, a memorandum type report may be used to supplement the F 6180.4.

The Hand Brake entry should include the manufacturer and model number.

The Handhold and Ladder Tread entries should show the clear, usable length.

The Power Brake block should show the type of brake applied, such as WABCO, ABDWXL or NYAB, ABDW. Additional information may be included describing the brake system(i.e., 12 inch cylinder, empty-load sensing equipped, etc.).

Photographs must be supplied that clearly show the safety appliance arrangements and non-complying conditions.

At the conclusion of the inspection, the Inspector should inform the car builder of their findings. However, Inspectors **are not to advise the builder that the "sample car" meets all Federal requirements.** Headquarters will advise the builder and the Region on results of the inspection.

Assessments

Assessments satisfy the need to develop sufficient database information about a specific railroad.

The Associate Administrator for Safety normally assigns assessments and usually they involve more than one Region. However, the Regional Director may assign an assessment on a regional basis.

Assessment Definition

An assessment means to conduct a concentrated or targeted investigation or examination of some or all activities of a railroad that may impact on safety of operation. Assessments may be conducted of:

- A system (all safety aspects of railroad operation).

- A division (all safety aspects of a division operation or some aspects of a division operation).
- Specific operation or an aspect of an operation.
- A facility (when conducted by field personnel from more than one discipline).
- Equipment or part of equipment (when conducted by Inspectors and Specialist and/or Chief Inspector).
- Team inspection (when conducted by Inspectors and Specialist and/or Chief Inspector or by Inspectors from more than one discipline).

Assessment Authority

Assessments are conducted under the authority vested in the Secretary of Transportation under the Federal Railroad Safety Act of 1970. The secretary has delegated authority over all areas of railroad safety to the Federal Railroad Administrator. The act provides the power to conduct special investigations and to promote safety in all areas of operations on the Nation's railroads. It further provides, after determination through testing, inspection, investigation, or research of an unsafe condition, for issuing an emergency order requiring unsafe conditions to be corrected.

Assessment Procedures

An assessment may limit the field effort by focusing or targeting on a specific operation or aspect of an operation, equipment, facility, or in areas where safety improvements are needed as indicated by the combined information of field observations and statistical measurements of performance.

To be effective,the assessment must be well planned. The preparation necessary to do an effective assessment includes:

- Analysis of all available information.
- Development of safety indicators.
- Determinations of high risk locations.
- Finding causes of safety problems.

- Reviewing existing inspection reports.
- Efficient utilization of FRA resources (if GAO recommendations are implemented).
- Gain the attention of top rail management for resolution of problem areas.

The assessment candidate selection process must include the use of fully documented statistical analyses of railroads' performances, in safety sensitive areas or areas that impact on safety, prior to selection of candidates. Also, during the initial candidate selection stage a determination must be made concerning the extent or limits of an assessment.

Assessment Planning

Assessments should be carefully planned in order to make effective use of Federal resources. The first priority is to collect, review and analyze all available information or data material. All pertinent safety material that may assist in conducting the assessment must be obtained. Most of the statistical information and analyses needed should be requested from and analyses will be conducted by the Office of Safety. However, regional offices must specify the type of information needed and for what railroad, division, facility, etc.

The following is a partial list of statistical analyses and information that should be requested and considered for the railroad that is a candidate for assessment:

- A listing of all railroad accidents/incidents and fatalities investigated by FRA field personnel. The listing must include the following for each occurrence:
  - The date.
  - The location (division, state, county, and facility).
  - Brief description of accident/incident or fatality.
  - Cause of the accident/incident or fatality.
- For reported railroad accidents, the following information is needed in tabular and graphic format for each of the past ten years and projected trends for each of the next two years based on the trends of the past four years for:

- Reported number of accidents and normalized accident rates per million train miles for the system, division, state, county, or facility.

- Reported number of accidents and normalized accident rates per million train miles by major cause codes (track, equipment, operating practices, signals, and other) for the system, division, state, county, or facility.

- For reported railroad casualties, the following information is needed in tabular and graphic format for each of the past ten years and projected trends for each of the next two years based on the trends of the past four years for:

  - Reported number of casualties and normalized casualty rates per 200,000 manhours of work performed for the system, division, state, county, and facility.

  - Reported number of casualties and normalized casualty rates per 200,000 manhours of work performed by major crafts for the system, division, state, county, and facility.

  - Unit defect ratios (number of noncomplying units divided by total number of units inspected) in tabular and graphic format for each 49 CFR Part, for each of the past five years, the nation wide average unit noncompliance ratio for each 49 CFR Part and for each of the five years, and projected trends for two years for the system, division, state, and facility.

  - For each 49 CFR Part list, for each of the past two years, in tabular and graphic format, the number of each of the deficiencies recorded by Federal and State Inspectors during compliance inspections.

- Complaint investigation information for each railroad, for the past four years containing the following:

  - Brief description of the complaint and related 49 CFR Part number(s).

  - Complaint number and the name of the region that conducted the investigation.

  - The date of the occurrence or the date of the letter.

  - The location of the occurrence.

- Filing of violation report.
- All NTSB recommendations and responses for the selected assessment candidate.
- Reports filed by railroads with FRA in compliance with:
  - Part 217 Railroad Operating Rules.
  - Section 217.7 - Filing.
  - Section 217.9 - Tests.
  - Section 217.11 - Instruction.
  - Section 217.13 - Annual Report.
  - Part 219 - Control of Alcohol and Drug Use.
  - Part 228 - Hours of Service.
  - Part 233 - Signal System.
  - Waivers applied for and granted.

In addition, violation reports filed by the Inspectors in each discipline and each Part for the past two years must be reviewed and considered by each Team Leader, Specialist, or Chief Inspector.

Using all the available data and information, each Team Leader, Specialist, or Chief Inspector must prepare an assessment plan that specifically includes:

- Scope.
- Purpose.
- Dates for meetings with railroad management and labor officials.
- Field instructions unique to the assessment.
- Determination and listing of "high risk areas" by discipline or craft, type, and

degree of field effort to be expended by each discipline at each area.

- Identify problem areas and/or areas with high noncompliance rates with Federal requirements.

- Ascertain, by craft, the reasons or underlying causes for the existence of high risk areas, unsafe work or operating practices, or areas having above the average noncompliance rate with Federal and industry requirements.

- Estimate, by discipline, manpower requirements and travel expenses.

Interview/Witness Statements

The Region Office will assign Inspectors to conduct interviews whenever applicable. The procedures and outlines for these interviews are covered in Chapter 5 under Report of Interview and Witness Statements.

Chapter 4

Enforcement Actions

General

The Motive Power & Equipment Inspector is not required to initiate formal enforcement proceedings each time he/she discovers a non-complying condition. To achieve compliance the Inspector has a choice of options;

- Verbal Repair Order. The **Locomotive Inspection Act** Sec. 9.(February 17, 1911, April 22, 1940.) (45 U.S.C., § 34.), in part, provides:

  > **That any common carrier violating this Act or any rule or regulation made under its provisions or any lawful order of any inspector shall be liable to a penalty. . . . .(emphasis added)**

  The Locomotive Inspection Act does not say that the lawful order has to be written; therefore, a verbal order to correct a non-complying condition on a **locomotive** is legally binding.

  A record will be retained by the Inspector when he/she chooses to use a verbal order to achieve compliance. If a follow-up inspection reveals non-compliance to the verbal order, the documented record can be referenced in a written report, violation, or individual liability.

- Exception. Documenting the non-complying condition on the proper form and requiring only that the condition is corrected before using the equipment.

- Violation. Used in conjunction with the requirements of an exception, a monetary penalty violation can be issued against the carrier.

- Special Notice for Repairs. Used in conjunction with the requirements of an exception and, with or without, issuing a penalty violation, equipment not in compliance with 49 CFR Part 215 or Part 229, can be removed from service until it is in compliance.

- Individual Liability. Action can be taken against individuals in conjunction with the requirements of an exception and, with or without, issuing a violation or special notice for repairs against the carrier. This topic is discussed extensively later in this manual.

Determining When and What Enforcement Action Is Necessary

FRA does not have to take a formal enforcement action every time it discovers or learns of a deviation from the Federal railroad safety laws. FRA has enforcement discretion: it can choose which cases to pursue based on its resources and on what it believes to be the best method of promoting compliance. Moreover, when FRA decides that enforcement action is called for, it has a range of enforcement tools (discussed below) and has the authority to choose those best suited to the circumstances. One of these tools (the emergency order) can be used to address an immediate hazard even if no existing law has been violated.

The existence of this wide enforcement discretion concerning when and what enforcement action is necessary calls for general guidelines to ensure effectiveness, fairness, and an acceptable level of consistency in the exercise of this discretion. The purpose of the guidelines is not to dictate absolutely identical treatment of identical situations. That would be an unrealistic ideal based on the false assumption that each of the many variables going into an enforcement decision could be objectively and accurately quantified. Instead, the purpose of these guidelines is to control the necessarily subjective elements of this process as much as is feasible by requiring that those making enforcement decisions weigh the same factors and make full use of objective information bearing on those factors. In this way, the appropriate enforcement tool is applied, responsible discretionary judgments are made,[1] and an acceptable level of consistency in similar situations is achieved.

FRA's Statement of Agency Policy Concerning Enforcement of the Federal Railroad Safety Laws (49 CFR Part 209, Appendix A) stresses that discretion is exercised at the field and regional levels; although Inspectors make initial determinations on the need for enforcement action, regional personnel play an active role in reviewing those determinations with an eye toward effectiveness and consistency. Moreover, Regional Specialists play a primary role in ensuring that field inspectors have the data necessary to make enforcement decisions. The Specialists, for example, periodically analyze the relevant data on accidents, incidents, and inspections to detect patterns or problem areas at the regional, railroad, or offeror level. This information should be used not only to

[1] Application of these factors should preclude abuses of discretion such as basing an enforcement decision on personal bias or failure to enforce the law because of a personal aversion to the extra work required.

decide where to inspect but, as discussed below, is also used to decide when and what enforcement action is necessary. Office of Safety headquarters personnel are, of course, responsible for spotting national trends in the data that require enforcement action and for providing guidance to the regional and field staffs on difficult enforcement policy issues.

FRA's policy statement sets forth seven factors to be considered in making enforcement decisions. The following discussion is intended to describe the thought process that should go into weighing each factor. The discussion applies to all FRA disciplines and, therefore, uses examples from all disciplines.

- **The Inherent Seriousness of the Condition or Action.** In the abstract (i.e., when the immediate circumstances are not considered), every violation is more or less severe than others. For example, a hazardous material shipping paper that is incomplete but still contains enough information to enable the material to be identified is less serious than a shipping paper that does not permit such identification to be made. Four hours of excess service is more serious than ten minutes of such service. Extremely wide gage is more serious than gage barely in excess of the limit. A freight car wheel that is loose on the axle is more serious than a wheel with a small crack.

These distinctions based on inherent severity are to some extent reflected in FRA's schedules of civil penalties. A good source of relevant information is the national data on accidents, incidents, and hazardous material releases; viewed over time (e.g., the most recent two or three years), these data bases provide useful insight into what are the most dangerous violations. But the use of hard data in considering this factor has its limitations. Accident/incident data may reveal little or nothing about a violation that is obviously serious (e.g., several hours of excess covered service where no emergency existed or an inaccurate shipping paper that could interfere greatly with emergency response).

This factor is very hard to apply between disciplines because the Inspectors and Specialists are not cross-trained in the various disciplines. Thus, inherent seriousness will usually be considered as a relative matter within each discipline. This is where regional and headquarters Specialists can play a significant role in explaining the relative severity of the various violations. Special care should be taken to keep the inspectors aware of any specific types of violations which cause an increasing proportion of accidents so that the inspector can focus on those violations as possible enforcement actions.

Moreover, a relatively non-serious violation is not automatically excluded from candidacy for enforcement. If that were true, whole portions of the law would never be enforced, which is unacceptable. Only when all of the criteria have been considered, can a

decision be made. Nevertheless, consideration of the inherent seriousness of a violation is a good place to begin. If the other factors do not point toward enforcement action, a relatively non-serious violation is a poor candidate for enforcement action as it is likely to produce little safety benefit in return for the FRA resources expended on enforcement.

- **The Kind and Degree of Potential Safety Hazard the Condition or Action Poses in Light of the Immediate Factual Situation.** While the first factor focuses on seriousness in the abstract, this factor focuses on the potential for injury or property damage posed by the violation in the context of its actual facts. For example, the seriousness of a track defect is probably increased over what it would be in the abstract if it occurs on a relatively high speed line with heavy hazardous materials or passenger traffic. Likewise, a hazardous material violation (e.g., failure to secure all openings of a tank car) may be exacerbated by the nature of the material and is certainly of greater consequence if it caused a leak of the material.

  On the other hand, a broken freight car wheel is inherently serious but may not pose a significant hazard if found on an inbound inspection at a major repair point where FRA is confident repairs will be made and necessary precautions will be taken in the meantime. Similarly, an hours of service violation for two hours of excess service that consisted of commingled service (e.g., a mandatory rules class) that came after all covered service and was followed by an adequate off-duty period poses little or no hazard to safety. By contrast, if the commingled service preceded the covered service, resulting in two hours of covered service beyond the twelve-hour on-duty limit, there would be a significant safety hazard.

  This factor cannot be viewed in isolation. If it were, recordkeeping and reporting violations, for example, might never result in enforcement action because the safety hazard they pose is usually so remote. Yet we know compliance with recordkeeping rules is vital to FRA's ability to enforce many of its other rules and accurate reporting is vital to the integrity of our data. Therefore, a conclusion that little or no actual hazard was caused by a violation does not automatically rule out the need for enforcement action.

- **Any Actual Harm to Persons or Property Already Caused by the Condition or Action.** The ultimate goal of our regulatory and enforcement programs is to prevent death or injury to persons or damage to property caused by unsafe behavior. Where a violation of the railroad safety laws has actually caused or contributed to the severity of such actual harm, there is every reason to take enforcement action and it should be taken in every such instance.

  Such violations should be submitted to the Office of Chief Counsel with a recommendation for Top Priority review. A cover memorandum explaining the basis for

such review must be included. The violation report itself must explain the causal link between the violation and the harm. The violation need not have been the sole or primary cause, and need not have been a cause at all if it contributed to the severity of the harm. To simply say a violation and some actual harm coincided (e.g., a shipping paper violation is discovered on a train involved in a fatal accident, but the violation played no apparent role in the accident's cause or severity) will not suffice. If no relationship between the violation and the harm can be shown, the violation may still be a strong candidate for enforcement, but not based on consideration of this factor. A violation report in such a case must also explain the extent of the harm. For example, rather than simply stating that two persons were injured by the violation, the report should discuss the nature and extent of the injuries. These cases are inherently strong candidates for extraordinary penalties so the report should provide information necessary to support such a claim.

- **The Offending Party's General Level of Current Compliance as Revealed by the Inspection as a Whole.** Most FRA inspections or investigations entail observation of more than one event or piece of equipment. This enables the inspector to draw a conclusion about the railroad or offeror's general level of compliance at the current time. At one end of the spectrum, this factor could lead the inspector to conclude that a violation is merely an aberration and enforcement action is not needed to encourage compliance. At the other end of the spectrum, violations may be so common that enforcement action--perhaps even an extraordinary remedy such as an emergency order if the violations are serious enough--is obviously in order.

  Ordinarily, of course, the facts will be somewhere in between, requiring the inspector to balance this factor against the seriousness of the violations and other factors. For example, an equipment inspector might inspect one hundred cars in one day and find very few defective conditions. So the inspector might conclude the company's current compliance efforts are generally good and decide that enforcement action is unnecessary or is necessary only on the most serious violations found. On the other hand, the inspection might reveal a multitude of violations that, even though not serious in relative terms, indicate a very poor compliance program on the part of the company. This could lead the inspector to recommend enforcement action on some or all of the violations discovered.

- **The Party's Recent History of Compliance with the Relevant Set of Regulations, Especially at the Specific Location or Division of the Railroad Involved.** A company's (or individual's) historical record of compliance is an important factor to be weighed. This is an important area where Office of Safety headquarters and the Regional Specialists will help the inspectors sift through the data for important indicators. The inspectors, of course, form their own impressions about companies and specific locations based on experience, but national and regional analyses of the data help the inspector

determine problem areas. Moreover, resource limitations prevent inspectors from getting to all locations as frequently as would be preferable, so inspectors may often encounter certain companies only rarely. The inspector who is forearmed with national and/or regional data on that company may be better able to focus the inspection and more or less inclined to take enforcement action depending on the broader picture of compliance.

This factor is aimed primarily at either spotting patterns of noncompliance that might not be apparent from a single, isolated inspection or patterns of good compliance that might temper an inspector's reaction to an otherwise unsatisfactory inspection. Although the consideration of this factor should be based on the available data, there is no rigid prescription for which data to include. Generally, the older the information, the less useful it is (noncompliance four years before the inspection is not very meaningful). The more specific the information, the more useful it is (e.g., a clustering of violations of a particular regulation over time may indicate the need to come down hard on any such violations currently discovered, especially if serious).

Focusing the review of the historical data on the particular facility presently involved often makes sense. If one facility or division manages to achieve a very high level of compliance as compared to the rest of the company or the industry generally, that argues for encouraging such efforts by restricting enforcement actions to the most serious matters. Of course, if one facility is clearly out of line in terms of historical and current compliance, that argues for taking enforcement action on even less serious violations in order to increase the deterrent effect. Spotting broader trends in the data (e.g., a particular railroad's frequent noncompliance with the hazardous materials placement regulations) that may have a systemic cause is the job of the regional and headquarters Specialists. Together, they can devise enforcement strategies (e.g., a recommendation to the Office of Chief Counsel that an action for an injunction against such violations be undertaken) responsive to patterns of violations revealed by analysis of the overall data.

- **Which Enforcement Remedy is Most Appropriate Under the Circumstances.** FRA has more than two options (civil penalty against the company or a warning) available when it detects noncompliance. Civil penalties and/or disqualification actions against individuals are one option. Emergency orders, compliance orders, and injunctions are also a possibility. In several areas, the inspector may issue a special notice for repairs, immediately removing the equipment or track from service. See 49 CFR Part 216. A combination of these options (e.g., a special notice and a civil penalty) may be the best way to ensure safety and compliance.

The inspector--with guidance on the difficult cases from regional and headquarters staff--needs to weigh all of the factors to determine the appropriate course of action. To decide whether action more severe than the implicit warning conveyed by an inspection report is necessary, one consideration is a formal enforcement action entails a considerable

investment of time to prepare the violation report and obtain necessary supporting documents. Time spent preparing violation reports is time not spent inspecting, so the inspector must carefully choose to enforce those violations that--due to the seriousness, frequency, and/or other reasons--are most in need of being deterred.

Where the inspector has decided that merely reporting his/her findings to the company or individual and discussing the need to improve compliance is unlikely to have a sufficient deterrent effect under the circumstances, the inspector will decide which enforcement tool is most appropriate. If the violation creates an immediate hazard of death or serious injury and the inspector is not confident of immediate corrective action, consideration should be given to a special notice for repairs and/or an emergency order. In the case of a situation that may well call for an emergency order, immediate consultation with the Regional Director is essential. Remember, emergency orders can be used even if the unsafe condition does not violate existing law if FRA can make a rational case that the conditions or practices create a hazard of injury or death.

If the violation presents a very serious risk of death or injury, but the risk is not so imminent as to warrant emergency action, or the violation actually caused significant harm (death, injury, or substantial hazardous material release), consideration should be given to a civil penalty case with a Top Priority recommendation. When submitted to the Office of Chief Counsel, such a report must include a cover memorandum from the region explaining the basis for the Top Priority recommendation so that the FRA attorneys can quickly determine whether this is in fact a violation that should be handled immediately ahead of others that were submitted before it. Such violations are also strong candidates for extraordinary penalties (i.e., penalties above the ordinary scheduled amount). If such a penalty is recommended, the report must indicate the basis for that recommendation. Except in the Hours of Service and hazardous materials areas, a penalty of up to $20,000 per violation is possible where a grossly negligent violation, or pattern of repeated violations, has created an imminent hazard of death or injury to persons, or has caused death or injury. If a penalty above $10,000 per violation is recommended, the report must include a cover memorandum from the region explaining that recommendation. Extraordinary penalties should never be recommended without providing the necessary support for the recommendation, as this will only delay transmittal of the penalty demand letter.

If the situation is not emergency, but the sheer volume of violations or their recurring nature suggests that a measure other than a civil penalty might be necessary to obtain corrective action on a specific problem, consideration should be given to recommending a compliance order or injunction. Keep in mind a compliance order entails the possibility of an administrative hearing before the order would even issue, so it is not a tool designed for extremely quick action. It is most likely to be useful only on the most clear-cut and repetitious violations where FRA has sought reasonable and well-defined

remedial action from the offender but has been met with resistance. In such situations a compliance order proceeding may provide the extra leverage FRA needs, but not result in cumbersome litigation because the facts are so indisputable.

Injunctions are court orders prohibiting violations that add the weight of the court's contempt powers to further FRA's compliance efforts. However, to obtain such an injunction FRA will first persuade the Department of Justice of the need for such extraordinary relief and, assuming that Department is willing to file suit, we will then be able to persuade the court that it should issue an injunction. This tool is most likely to be used where civil penalties alone have been ineffective in lessening the frequency of a particular type of violation, the violation is serious, and the company is unusually obstinate in its safety behavior.

Individual liability is a tool to consider in any situation where deterring a particular individual's noncompliance is most needed. This tool is especially useful where the violation arose from the individual's own choice. Where the violation is more attributable to corporate policy or failure by the company to properly train or supervise the individual, the company is usually the better target (unless the policy or failure can be traced directly to a specific individual). The inspector need not choose between individual liability and corporate liability. In some situations, enforcement action against both will be warranted.

- **Such Other Factors as the Immediate Circumstances Make Relevant.** The foregoing list is not all-inclusive; specific situations may involve specific facts that do not fall under any of those headings but need to be figured into the decision of whether to take enforcement action. Perhaps the most common of these additional factors is the violator's culpability, i.e., the relative degree of blameworthiness. Most of the railroad safety laws do not make a person's mental state an element that FRA must prove to establish a violation. Most of those laws provide for strict liability, i.e., if the violation occurred the offender may be penalized whether its actions were purposeful or accidental. In some areas, however, FRA must prove a certain level of knowledge in order to assess a penalty: In hazardous materials cases, FRA must establish the violative acts were committed "knowingly." In civil penalty cases against individuals, FRA must establish the violation was committed "willfully." In track cases, FRA must establish the violator knew or had notice of the noncomplying conditions.

  Even where the law does not require FRA to establish the offender's mental state, culpability is a factor that should be considered in deciding whether to take enforcement action. For example, the violation may have been the result of good faith misunderstanding of the relevant law, which often happens when a regulation is brand new or inherently ambiguous. Unless the violation is very serious, enforcement action would ordinarily not be appropriate where there is solid evidence that such a good faith

mistake was actually the cause. Such good faith mistakes, which imply an honest attempt to know and obey the law, should not be confused with simple ignorance of the law resulting from a failure to attempt to know it.

Culpability is also very low where the violation is discovered on the property of one company that has not had a reasonable opportunity to correct it but the violation was clearly more attributable to another company. For example, this may be true with regard to an equipment defect where the receiving railroad has hauled the car only a short distance from interchange to a major repair point and FRA is confident--based on its experience at that location--that the violation would have been caught and corrected by the receiving railroad even had FRA not been present. There, the better candidate for enforcement action would be the delivering railroad if the evidence indicated that the defect was present when that railroad delivered the car. Likewise, where a placarded tank car is found on railroad property with loose fittings that could not be observed from the ground and with no evidence of a leak, the culpable party is nearly always the car's offeror. The offeror has the primary responsibility to ensure all closures on a car are secured in such a manner as to remain secured under normal operating conditions. To get at the root cause of the problem, the violation should be taken against the offeror (unless there is some evidence of vandalism or extremely rough handling since the car left the offeror).

While very low culpability might tip the inspector's discretion toward not taking enforcement action, very high culpability might have the opposite effect. For example, a clearly willful violation may warrant enforcement action even if isolated or not especially serious. Blatant disregard for the law even on relatively lesser matters may indicate an overall poor attitude toward compliance which could carry over to very serious matters. Where a violation is willful, FRA's penalty schedules provide for higher than normal penalties. If a willful penalty is recommended, the violation report must explain the basis for concluding that willfulness (as defined in 49 CFR Part 209, Appendix A) was present. Willful penalties should not be recommended without support, as this will only slow the processing of the violation report.

Inspectors and regional personnel are not expected to spend hours deliberating about every possible enforcement action. Instead, these guidelines are intended to provide a framework for enforcement personnel to incorporate into their entire approach to enforcement so these factors are weighed quickly and effortlessly in most situations. Of course, the time spent weighing these factors should correspond to the seriousness of the situation. Application of these factors should produce positive results: (1) enforcement should be more effective because inspectors should be better able to recommend the enforcement action appropriate to the circumstances; (2) enforcement should be more fair because enforcement decisions will not be made on the basis of inappropriate factors; and (3) enforcement should be more consistent because it will be to some extent guided by

empirical compliance data and by the application of criteria which should minimize the arbitrariness of necessarily subjective judgments.

Determining the Existence of a Violation

To determine if a violation exists, the Inspector must have a thorough knowledge and understanding of the motive power and equipment regulations. To help the Inspector gain this understanding, a synopsis of the regulations, an interpretation of the meaning of each regulation and the defect codes to be used to document each type of violation are given in the chapters of these guidelines which follow. The following regulations are covered in greater detail in these chapters:

49 CFR Part 210 Railroad Noise Emission Compliance Regulations

Note: This part prescribes minimum compliance regulations for enforcement as established by the Environmental Protection Agency in 40 CFR Part 201.

49 CFR Part 215 Railroad Freight Car Safety Standards

Note: Does not apply to a freight car used exclusively in dedicated service as defined in § 215.5(d) or Maintenance of Way Cars used in maintenance-of-way service(including self propelled maintenance-of-way equipment) that do not exceed 20 mph and are **not used** in revenue the service, properly stencilled according to 49 CFR Part 215.305.

49 CFR Part 218 Subpart B - Blue Signal Protection of Workmen

Note: This part prescribes minimum requirements for the protection of railroad employees engaged in the inspection, testing, repair and servicing of rolling equipment whose activities require them to work on, under, or between such equipment and subjects them to danger of personal injury posed by any movement of such equipment.

49 CFR Part 221 Rear End Marking Device

Note: This part prescribes minimum requirements governing highly visible marking devices for the trailing end of the rear car of all passenger, commuter and freight trains.

49 CFR Part 223 Safety Glazing Standards - Locomotives, Passenger Cars and Cabooses

Note: Does not apply to locomotives, passenger cars and cabooses that are historical or antiquated and used only for excursion, educational, recreational purposes or private transportation purposes.

49 CFR Part 229 Railroad Locomotive Safety Standards

Note: Does not apply to a railroad that operates only on track inside an installation or Rapid transit operations in an urban area that are not connected with the general railroad system of transportation.

49 CFR Part 230 Locomotive Inspection (Steam Powered)

Note: This part last published October 1, 1978.

49 CFR Part 231 Railroad Power Brakes and Drawbars

Note: This part applies to all rolling equipment operated on the general railroad system of transportation.

49 CFR Part 232 Railroad Power Brakes and Drawbars

Note: This part applies to all rolling equipment operated on the general railroad system of transportation.

Once an Inspector has used these regulations to determine a violation exists, he/she must exercise good judgement to make the initial determination of the course of action to follow. The Inspector has considerable enforcement discretion. How this discretion is exercised to efficiently use FRA resources to achieve compliance is the essence of the Inspector's job.

To determine the most appropriate enforcement action, the Inspector should consider;

- The inherent seriousness of the condition or action
- The kind and degree of potential safety hazard the condition or action poses
- Any actual harm to persons or property already caused by the condition or action
- The offending party's (i.e., railroad's or individual's) general level of current compliance as revealed by the inspection as a whole
- The party's recent history of compliance with the relevant set of regulations, especially at that specific location or railroad division
- Such other factors as the immediate circumstances make relevant

After considering all factors, the Inspector should select the most appropriate action to take. If the Inspector has doubts as to the most appropriate action, he/she should seek the advice of a Supervisor Specialist. The remainder of this chapter is devoted to a discussion of the enforcement actions available to the Inspector.

Enforcement Actions Against Individuals

- **General Principles.** Motive Power & Equipment individual liability cases will be addressed pursuant to 49 CFR Part 209, Appendix A.

  Before taking enforcement action against an individual, the inspector will determine from the totality of the facts and circumstances whether actual knowledge or reckless disregard for the regulations existed. The more clear-cut example occurs when the act in violation was committed by or at the direction of the individual following a specific warning from an FRA inspector to that individual that such an act would be a violation of Federal law. However, that is not the only possible situation which establishes individual liability. The inspector will investigate to gather all relevant information, and determine from that information if the tests for individual culpability can be met.

- **Decision to Issue a Regional Level Warning.** When an inspector determines that an individual should be issued a regional level warning for a violation, the inspector shall orally advise the individual of the facts, including the fact that the inspector intends to recommend that a written warning notice be issued to the individual. This will ensure that the individual immediately knows that he/she has performed an unlawful act and should not do so again. The circumstances, including the time of the violation and the time the individual was so notified, shall be carefully noted by the inspector.

  As soon as practicable, the inspector will contact his/her Regional Specialist, who will arrange a conference call with the Regional Director or regional staff member delegated by the Director. If the Specialist is not available, the inspector shall directly contact the Regional Director.

If the facts support at least the issuance of a regional level warning against the individual, the inspector will submit a completed F6180.80 to the Regional Director, making sure to check item 4 "NO" to indicate that no formal enforcement action will be recommended. The Regional Director will then co-sign the form and mail the original (first copy) to the individual by registered mail. Further, the Regional Director will insert the region's sequential calendar year report number (e.g., 3-90-1) in the space provided in the upper right corner on the copies only and will mail the appropriate copy to RRS-1 in an individual envelope with "F6180.80" marked on the outside, mail the "Employer" copy to the individual's employer, and retain the appropriate copy in the secure regional file.

Note: If it is subsequently determined that no violation occurred, the inspector will contact the individual and discuss the circumstances that led to the verbal warning and explain why the warning was not valid.

- **Decision to Recommend a Formal Warning Letter or Assessment of a Civil Penalty.** When an inspector, or Regional Director, determines that an individual should be issued a warning letter from the Office of Chief Counsel or assessed a penalty, the inspector shall orally advise the individual of the circumstances surrounding the violation, including the fact that the inspector intends to recommend formal enforcement action against the individual. This will ensure the individual immediately knows he/she has performed an unlawful act. The circumstances, including the time of the violation and the time the individual was notified shall be carefully noted by the inspector.

  As soon as practicable, the inspector shall contact his/her Regional Specialist, who will arrange a conference call with the Regional Director or regional staff member delegated by the Director. If the Specialist is not available, the inspector shall directly contact the Regional Director.

  The Regional Director will contact the Director of Safety Enforcement and the Assistant Chief Counsel for Safety and advise them of the circumstances. When headquarters concurs in the need and basis for formal enforcement action, the inspector will submit a completed F6180.80 (checking Item 4 "Yes") and a narrative memorandum detailing the facts to the Regional Director, which should show as its subject: "Violation Report concerning (fill in individual's name) with a recommendation for (fill in with formal warning letter or penalty)". The memorandum must specifically address each element necessary to make a case against an individual in the format prescribed in Chapter 5. The Regional Director will co-sign the F6180.80 and mail the original to the individual by registered mail. The Regional Director will insert the region's sequential calendar year number in the space provided in the upper right corner on the copies.

The appropriate copy of the F6180.80 and the original and one copy of the memorandum and any attachments, shall be forwarded to the Assistant Chief Counsel for Safety, RCC-30, for further action. (Do not use violation report transmittal form FRA 6180.72 for this transmission or include these documents in any envelope with unrelated violation reports against railroads or offerors.) The appropriate copy of the F6180.80 and a copy of the memorandum shall be forwarded to RRS-1 in an individual envelope with "F6180.80" marked on the outside, and the appropriate copy shall be retained in the secure regional file. The "Employer" Copy will be mailed to the individual's employer.

- **Guide to Preparation of Violation Reports Against Individuals.** In any violation report recommending assessment of a civil penalty or issuance of a warning letter, the FRA inspector should address the following subjects under separate headings:

  - Factual Details. All factual details of the violation(s) must be explained, with specific references to sources of proof if other than the inspector's own observations. The Violation Report (Form FRA F6180.67) should not be submitted but should provide some assistance as a guide to the basic facts that must be explained.

  - Severity of the Violation(s). The memorandum should describe in detail any harm (e.g. derailment, personal injury, leakage and/or evacuation) that resulted from the violation or was seriously threatened by the violation. Any aggravation of the offense caused by the degree of the violation should be discussed here.

  - Culpability of the Individual. Keep in mind that a civil penalty may be assessed against an individual only if that individual has actual knowledge of the law or acts in reckless disregard of legal requirements. (49 CFR Part 209, Appendix a, contains a detailed discussion as to what constitutes a violation). This section should address four factors:

    - Knowledge of the facts. The memo should explain whether the individual, with regard to each alleged violation, actually knew or had a duty to know of each fact constituting the violation. If actual knowledge (e.g. insecure closures) is alleged, explain what supports that allegation (e.g. a crewman's conversation with a yardmaster in which the crewman pointed out the defect). An admission of knowledge is not necessary, but there must be sufficient information from which the reasonable inference is that the individual knew of the facts. If the allegation of violation consists of a failure to meet a duty to know the facts, explain the basis for concluding that the person had the duty and failed to meet it (e.g. an offeror's employee assigned to inspect a tank car prior to shipment does not fully complete his/her task and fails to discover obvious defects).

- Knowledge of the law. This section should explain what the individual knew of the particular law allegedly violated: Had it been discussed with FRA prior to the incident? Had the person been trained on the particular law or corresponding railroad or offeror rules? Is the requirement of the law so fundamental to safe transportation of hazardous materials by railroad that any violation of the law should be seen as reckless disregard of the law?

- Compliance history. This section should address any previous enforcement actions against or warnings (even informal) given to the individual concerning compliance with the particular requirement(s) now violated or other railroad safety laws, and any railroad disciplinary record relevant to compliance with safety requirements.

- Mitigating factors (if any). In some situations certain factors will be present that tend to lessen the severity of the violation or the culpability of the individual (e.g. the requirement was new and the individual had not been fully trained on it). These factors should be addressed in fairness to the individual.

- Recommendation. This section will briefly state the inspector's recommendation as to whether a warning letter or civil penalty is appropriate.

Note: The inspector should remember that he/she may called on to testify under oath concerning each and every allegation in it, either before an administrative law judge or in Federal district court. As with any violation report, great care must be taken to substantiate all assertions, but this is especially true where, as here, the person's livelihood is at stake.[2]

Privacy Act Restrictions

The Privacy Act makes individuals, including FRA employees, personally liable for unauthorized release of information from any "system of records" about individuals maintained by the Federal government. FRA has two systems of records (one kept by the Office of Safety, the other kept by the Office of Chief Counsel) concerning noncompliance with the railroad safety laws by individuals. Included in those systems

[2] Requirements for testifying are found in 49 CFR Part 9.

of records are (i) information contained in a form 6180.80 notice concerning the individual to whom the notice is addressed or (ii) any other information contained in a "system of records" concerning the individual's noncompliance, such as a computer or paper file on a particular violation by an individual for which the individual is being investigated, warned, or cited for penalty as an individual.

Agencies are, however, permitted to make certain disclosures from their Privacy Act systems of records when necessary to further certain "regular uses" if a notice proposing such regular uses has been published in the Federal Register and a comment period has run. FRA has established the following regular uses for information contained in the Office of Safety Individual Enforcement Case System:

- To review these records to determine whether cases should be forwarded to the Office of Chief Counsel for prosecution.

- To otherwise review these records to accomplish the mission of the Office of Safety.

- To disclose pertinent information in these records to any source from which additional information is requested in the course of conducting an investigation to the extent necessary to identify the purposes of the request and to identify the information requested.

- To provide notice of the investigation and its outcome to the individual's employing railroad or offeror or another railroad related to the case through joint facilities or trackage rights in order to give those entities information they may need to assist in preventing a recurrence of noncompliance.

- To provide information concerning enforcement actions for violations of safety statutes and regulations to government agencies and the regulated industry in order to provide them with information necessary to carry out their responsibilities.

- To provide information concerning enforcement actions for violations of safety statutes and regulations to the public in order to increase the deterrent effect of the actions and keep the public informed about how the laws are being enforced.

55 Fed. Reg. 17851 (April 27, 1990).

These regular uses provide regional personnel and field inspectors sufficient flexibility to accomplish their mission without running afoul of the Privacy Act. For example, the third use clearly permits inspectors to disclose information about individuals to any

source of pertinent information to the extent necessary to identify the purpose of the information request and identify the information requested. Ordinarily, only the fact that an investigation is being conducted and the name of the individual should be provided to the person from whom you are requesting information. The fourth regular use is what permits the regional office to send a copy of the 6180.80 notice to the individual's employing railroad or offeror.

However, in order to ensure that the regular uses are not misapplied or applied inconsistently, disclosure of information on individuals to those outside FRA other than the types of disclosure discussed in the preceding paragraph may not be made without prior approval from Office of Safety headquarters, which will consult with the Office of Chief Counsel on the propriety of any such disclosure. Moreover, certain rules on storage of records on individuals must be observed in order to comply with the Privacy Act.

Accordingly, inspectors are <u>not</u> to maintain file copies of records about noncompliance of an individual after they have forwarded a notice concerning that individual to the region; instead, inspectors will submit their file to the region. Regional Directors will establish a secure file for all such records and will ensure that, except as discussed above, no information contained in this file is released without the authorization of Office of Safety headquarters. Information submitted by the individual will be placed in that file along with the other pertinent records. The files will be stored in file cabinets that will be locked after working hours. Automated files will be password-protected and will be retrievable only by direct terminal access with the selection of the data elements determined by the authorized user. Manual (paper) records will be retained for a period of three years. Automated (computer) records will be maintained for five years. (Consult the Office of Chief Counsel prior to disposing of any records that may still be subject to an enforcement action.) Disposal will be by shredding, except that certain automated records will be retained indefinitely to provide complete compliance histories.

To avoid problems in this area, regional and field personnel should follow this general rule: except for sending the individual's employer its copy of the 6180.80 notice, do not disclose records about individuals to, or discuss information in those records with, anyone outside the agency except as is necessary to complete the investigation and any resulting enforcement action or as specifically authorized by Office of Safety headquarters.

Federal Railroad Administration

Actions Against Railroads

Extraordinary measures to take action railroads are available to properly address particularly serious and dangerous situations. These measures are addressed in 49 C.F.R. Part 209, Appendix A, and include the following processes:

FRA Emergency Orders

- Under Section 203 of the Federal Railroad Safety Act of 1970, Emergency Orders may be issued by the Federal Railroad Administrator when he has determined, through testing, inspection, investigation, or research, that an unsafe condition or practice, or a combination of unsafe conditions or practices, creates an emergency situation involving hazard of death or injury to any person. The Administrator may impose such restrictions or prohibitions as may be necessary to correct the emergency situation.

Compliance Orders

- The Administrator is also authorized by Section 109(a) of the HMTA to issue compliance orders, i.e., orders directing compliance with the regulations issued under the HMTA. Procedures for issuance of such orders are found at 49 CFR Part 209.

Injunctions

- Section 111 of the HMTA authorizes the Administrator to seek injunctive relief from a court to redress violations of these regulations or any imminent hazard related to hazardous materials transportation by railroad. Note that, unlike civil penalties, this remedy is not confined to violations committed knowingly.

Chapter 5

Field Reporting Procedures and Forms

General

Two important topics are covered by this chapter. The chapter gives instructions for completing the following forms frequently used by FRA Inspectors:

* Motive Power and Equipment Inspection Report F 6180.59

* Steam Locomotive Inspection F 6180.59

* Violation Reports
  - Transmittal of Violation Report F 6180.72c
  - Freight Car Safety Standards Violation Report F 6180.68
  - Violation Report Supplement F 6180.69
  - Locomotive Violation Form F 6180.10
  - Safety Appliance Violation Form F 6180.29
  - Safety Appliance Violation Air Brake Supplement F 6180.29a

* Locomotive Compliance Review Inspection Summary

* Freight Car Enforcement Summary Report

* Special Notice For Repairs F 6180-8

* Special Repair Report F 6180-8a

* Waivers Inspector's Report Forms for MPE Petitions

* Report of Interview

* Witness Statement

Completed examples of each of these forms are included at the end of Chapter 5.

Further, as part of the instructions for completing Violation Reports, the chapter gives guidance on how to document and fully substantiate a superior violation to stand-up during claims collection against the legal defense prepared by the offending railroad. Examples of correctly documented cases leading to an individual warning letter and to an individual liability fine are given.

Motive Power and Equipment Inspection Report F 6180.59

A Motive Power & Equipment Inspection Report, F 6180.59, must be completed whenever inspection activity is performed. This includes inspection activity performed during regular inspections, accidents, complaint work, waiver petition investigations, and assessment activity. Separate report forms shall be used to report defects resulting in violations and defects which did not result in violations.

Information recorded on the F 6180.59, is entered into FRA's data base and assists in monitoring the effectiveness of FRA's inspection program, railroad compliance history, and the activity of individual inspectors.

The F 6180.59, allows the use of computer aided storage and retrieval of vital inspection data. Accurate completion of the form is essential to integrity of the data base and facilitates timely processing of each report. Forms rejected due to errors, disrupt the data base and reflects negatively on the individual who completes the report.

When inspection activity results in the submission of a violation, the Inspector should retain the top copy (original) and attach it to the completed violation report. The second copy will be forwarded to the data processing contractor for processing, the third copy will be forwarded to the Region Office, and the fourth copy will be presented or if the inspector was not accompanied by a railroad representative sent, to the railroad on the same day the inspection was done.

If inspection does not reveal conditions that warrant a violation, the original will be forwarded to the data processing contractor, the first copy will be forwarded to the Region Office, the second copy can be retained by the Inspector and the third copy will be presented or sent to the railroad.

Guide to Completing the Report

1. Inspector — The inspector performing the inspection must sign the report.

   Employee I.D. Number — Enter employee I.D. number

2. Report Number — Enter the report number. Reports should be numbered sequentially beginning with January 1, of each year

3. Region — Enter the FRA Region number to which the inspector is assigned, regardless of the location where the inspection activity is conducted.

4. Railroad Representative — Print the name and title of the railroad representative who receives the report. If willing, have the representative sign the report to acknowledge receipt. It is mandatory that a railroad representative be notified of any inspection made.

5. Railroad — Enter the corporate name of the railroad responsible for the equipment inspected. If inspected at interchange, name the delivering and the receiving railroads. A copy of the report should be provided to each railroad. If the inspection is made on a neutral railroad's property and that railroad will not handle or inspect the equipment, the neutral railroad need not be named other than as a location.

6. Report Date — Enter the date inspection activity was conducted. The year, month and day should be indicated by using a two digit number (e.g., May 1, 1992, would be 92/05/01).

7. Source Code — Enter the applicable source code that corresponds to the type of inspection activity conducted.

Code
1. Compliance
2. Regular Inspection
3. Waiver Investigation
5. Special Investigation and Assessment
6. Accident Investigation
7. Federal Assistance Projects
O. Other
M. Inspection at Manufacturer's Facility (such as sample car)

8. File Number — If applicable, enter the file number assigned by the Office of Safety. File numbers are used for special inspections, complaints, accidents, and waiver petitions. If conducting routine inspection activity, leave this space blank.

9. Inspection Point & Location — Enter the city, state, and station name where the inspection is conducted (e.g., Albany, N.Y. - Main St. Yard). It shall correspond exactly with the name shown on the Regional Inspection Point list.

Division — Enter the 6 letter railroad division code from the current list of codes. If the railroad has no assigned division code, enter the word "SYSTEM".

Location — Enter the GSA Geographical Code, for the state and city, in which the inspection activity is performed. If the inspection was performed outside of city limits, enter the county code preceded by the alpha character "c".

10. Regional Use Only — To be used when reporting Steam Locomotive Inspection activity (see Steam Locomotive Inspection), and as otherwise instructed by your Region office.

11. Inspection Summary

A. CODE 215 - Freight Car Safety Standards

B. Enter the total number of freight cars inspected for compliance with requirements of Part 215

C. CODE 223 - Safety Glazing Standards

D. Enter the total number of locomotives, passenger cars, and cabooses inspected for compliance with requirements of Part 223

E. CODE 229 - Locomotive Safety Standards

F. Enter the total number of locomotives inspected for compliance with requirements of Part 229.

G. CODE 231/232 - Safety Appliance Standards and/or Power Brakes and Drawbars

H. Enter the total number of locomotives and/or cars inspected for compliance with requirements of Part 231 and 232

I. CODE 218 - Subpart B - Blue Signal Protection of Workmen
CODE 221 - Rear End Marking Device

J. Enter the total number of units inspected for compliance with requirements of Part 218 and/or Part 221 (identify)

K. Total cars inspected

L. Enter the total number of **cars** inspected for compliance with all applicable regulations

12. Units Inspected

A. Item - Number each defect sequentially

B. Initials - Enter the initials of the defective equipment. (Maximum of four (4) digits)

C. Number - Enter the number of the defective equipment. (Maximum of six (6) digits)

D. Kind - For each locomotive/car

Code	Denotation
EMF	Electro-Motive Division Freigh
EMP	Electro-Motive Division Passenger
EMS	Electro-Motive Division Switch
ALF	ALCO Freight
ALP	ALCO Passenger
ALS	ALCO Switcher
BLF	Baldwin Freight
BLP	Baldwin Passenge
BLS	Baldwin Switcher
GEF	General Electric Freight
GEP	General Electric Passenger
GES	General Electric Switcher
FMF	Fairbanks-Morse Freight
FMP	Fairbanks-Morse Passenger
FMS	Fairbanks-Morse Switcher
RDC	BUDD RDC
MU	Multiple Unit
STM	Steam
OT	Other
EPG	Electric Passenger Locomotive - GE
EFG	Electric Freigh Locomotive - GE
EPE	Electric Passenger Locomotive - EMD

EFE	Electric Freight Locomotive - EMD
TUB	Turbine Locomotive

Car	Denotation
AC	Articulated Car
AR	Auto Carrier
B	Box, Refrig., Stock
C	Caboose
CG	Covered Gondola
CH	Covered Hopper
CR	Crane
D	Air Dump
F	Flat
FB	Flat with Bulkheads
FC	Flat Equipment for Hauling Trailers
G	Gondola
H	Hopper
P	Passenger, Coach, Sleeper, Parlor, etc.
T	Tank
O	Other

Note: If any of the reported cars are work equipment the letter code should be preceded by the letter "W".

E. 49 CFR Part - Enter the applicable CFR Part number

13. Observation/Inspection/Equipment Defects

A. Rule - See appropriate Chapter for applicable three (3) digit rule listed in the reporting codes.

B. Subrule - In this column, enter the appropriate letter and number listed in the applicable reporting codes.

C. A,B,F,R - Locate the defect as to the A or B end of a car or the front (F) or rear (R) of a locomotive

D. Enter "PL" for placarded load of hazardous material or enter "PR" for placarded residue hazardous materials car.

E. Blank - To be used as instructed

F. FRA Action/Location - For All Inspections, the following action codes are used.

Code	Denotation
1	No violation report filed.
2	Violation report filed.
3	Removed from service.
4	Violation report filed and unit removed from service (Special Notice for Repairs)

Note: This data refers to the action taken by the Safety Inspector, and will be used to tabulate the number of violation reports filed and number of units removed from service.

The location where the unit was inspected is shown by the location code as follows:

Code	Denotation
S	Shop
Y	Yard
I	Inbound Train
O	Outbound Train - 1000 Mile Inspection Point
F	Fueling station

For instance a locomotive inspected in a yard and removed from service would be 3Y.

G. Train Number - For all equipment inspected in a train inbound or outbound and train brake test observations the train number will be entered. Symbol designations may be used if the train is an extra train , as an example "X5234E" ; this will designate an Extra train, the controlling locomotive number and the direction. If the train is a transfer train, "Trans" will be entered. For records inspection the number of records will be shown.

H. Description - Enter a brief description of the defective condition

I. Railroad follow-up - This section to be completed by the railroad (Instructions on back of last copy).

Steam Locomotive Inspection - Form F 6180.59

Previous written instructions to Regional Directors, regarding special handling of steam locomotive inspection reports, are rescinded. Steam locomotive inspections will be reported in the same manner as other routine inspection activity, with the following exceptions. In item 10 of the F 6180.59, write in " 230 - " and the total number of steam locomotives inspected e.g..

An advisory copy of the report should be mailed to the Office of Safety, RRS-14.

Violation Reports

General Information Required For All Violations Report Forms

A narrative memorandum shall be prepared and attached to the violation report when submitted. The memorandum shall state only those facts which relate to the violation and include the following information:

- Full corporate name.
- Date and time of your inspection.
- Names of all FRA inspectors who witnessed the violation, and name of railroad official(s) who accompanied you during the inspection.
- Location of violation.
- A detailed description of what was found during the inspection. This should include a description of the defects submitted for violation and those handled for correction.
- Describe the repair facilities and resources available. Indicate whether repairs of the nature required were available at the point of origin of the equipment, or where found defective, whichever is applicable.
- A brief summary of the compliance history of the location.
- The location where the defective equipment originated (locomotive violations should include the date and location of the last periodic inspection, date and time of last daily inspection, and the location where the locomotive is assigned for maintenance).

- o Custodian of the records: Provide a name and address where Chief Counsel can locate repair records, or other information they may need when processing the violation. This usually will be the location that repaired the defects noted during inspection.

Inspectors must carefully consider the circumstances surrounding each instance of a railroad being in non-compliance with Federal safety regulations. The Inspector must decide if the instance is serious enough to warrant a violation.

Further, the Inspector in determining if a violation report should be issued, must consider all of the conditions contained in Appendix A of 49 CFR Part 209:

1. The inherent seriousness of the condition or action;

2. The kind and degree of potential safety hazard the condition or action poses in light of the immediate factual situation;

3. Any actual harm to persons or property already caused by the condition or action;

4. The offending person's (i.e., railroads or individual's) general level of current compliance as revealed by the inspection as a whole;

5. The person's recent history of compliance with the revelant set of regulations, especially at the specific location or division of the railroad involved;

6. Whether a remedy other than a civil penalty (ranging from a warning on up to an emergency order) is more appropriate under all the facts;

7. Such other factors as the immediate circumstances make relevant.

Examples of correctly written violation memos resulting in an individual liabilty warning letter and in an individual liability fine being assessed are given at the end of Chapter 5.

Railroad Freight Car Safety Standards Violation Forms F 6180.68

This form must be completed for each violation of 49 CFR 215, Freight Car Safety Standards.

INSTRUCTIONS:

1. Name of Inspector(s)

Enter the initials and last name of Inspector(s) submitting the violation report.

2. Violation Report Number

The Inspector submitting the violation enters a number which is in sequential order commencing with 1 and continuing on until his or her service is ended.

*In this block also indicate number of total pages.

3. Interchange Railroad Violation Report Number

Enter interchange railroad violation report number if applicable.

4. Operating Railroad

Enter the corporate name of the railroad which is in violation.

5. Car Initials and Number

Self explanatory

6. Car Description

Enter the car type; indicate load or empty and tonnage. If applicable, indicate placard.

7. Item Number

Number each violation sequentially

8. Component Description

Identify the freight car part that is defective and not in compliance with Federal regulations..

9. Defect Description

Describe the defective condition of the freight car

component.

10. 49 CFR Section

Enter the appropriate 49 CFR part, subpart, and section.

11. Car Marked For Repair With Bad Order Tag

Indicate yes or no; if yes, describe tag information in block 14.

12. Track Number

Identify the track the car was on at the time of the violation.

13. Time

Enter the time the car was inspected and the time of the violation.

14. Additional Information

Enter any additional information which might be beneficial to establishing the violation.

15. Signature of Inspector(s)/Date of Signature

Self explanatory.

Violation Report Supplement F 6180.69

This form must be completed to provide additional information for each violation of 49 CFR 215, Freight Car Safety Standards.

INSTRUCTIONS:

1. Name of Inspector(s)

Enter the initials and last name of Inspector(s) submitting the violation report.

*Indicate Federal or State Inspector

2. Violation Report Number(s)

Enter violation report number(s) from Freight Car Safety Standards Violation Report (Form FRA F6180.68).

3. Inspection Report Number

Enter the Inspectors F6180.59 report number.

4. Operating Railroad

Enter the corporate name of the railroad which is in violation.

5. Station

Enter the city and state where the inspection took place.

6. Place of Inspection

Identify the yard or facility where the inspection was made.

7. Railroad Division, Subdivision or District

Enter the division of the operating railroad where the inspection was made.

8. Date of Violation(s)

Self explanatory.

9. Service Constituting Violation

Place check in appropriate box.

10. Description of Movement or Location of Car(s) at Time of Violation

Describe the train movement or the status and location of the car(s) at time of violation.

11. Train Number

Enter the train's number or symbol. If train is an extra, use the lead locomotive's number preceded by an X. Place the appropriate letter at the end of the number to indicate direction of travel. (X3527E)

12. Locomotive Initials and Number

Self explanatory.

13. Number of Cars in Consist

Enter the total number of cars then place a check in the appropriate box.

14. Time Period of Inspector Observation

Enter the time the observation began and the time it ended.

15. Notification of Violation

Enter the date, time, name, and title of the railroad representative notified of the violation.

16. Railroad Response

Enter any remark or action taken by the railroad when informed of the violation.

17. Additional Information

Enter any additional information which might be beneficial to establishing the violation.

Locomotive Violation Report Form F 6180.10

This form shall be used to report each violaton of 49 CFR 229, Locomotive Safety Standards.

INSTRUCTIONS:

1. Report Number

The Inspector submitting the violation enters a number which is in sequential MP&E order commencing with 1 and continuing on until his or her service is ended.

2. Companion Report Number

Enter the Inspectors F6180.59 report number.

3. Inspector(s) Name

Enter the initials and last name of Inspector(s) submitting the violation report.

4. Operating Railroad

Enter the corporate name of the railroad receiving the violation.

5. Date(s) of Violation

Self explanatory

6. Time of Violation

Self explanatory

7. Inspection Point or Location

Enter the city, state, and location where the locomotive was inspected.

8. Division

Enter the division of the operating railroad where the inspection was made.

9. Type of Service

Enter the type of service for which the locomotive is designated.

10. Date, Time & Location of Last Daily Inspection

Enter the date, time, and location where the locomotive last received a daily inspection.

11. Date & Location of Last Periodic Inspection

Enter the date and location where the locomotive last received a periodic inspection.

12. Locomotive Initials and Number

Self explanatory.

13. Locomotive Service Status

Indicate the status of the locomotive at the time of inspection.

14. Name and Title of Railroad Official Contacted

Enter the name and title of the railroad representative notified of the violation.

15. Was Form F6180.8 Part 1 issued

Indicate yes or no; if issued, indicate if Form F6180.8 Part 2 was returned.

16. Violation of 49 CFR Section Number

Enter the appropriate 49 CFR part, subpart, and section.

17. Description of Use Constituting Violation

Describe how the locomotive was used to warrant a violation.

18. State All Facts Necessary To Establish Violation Include Name and Location of Custodian of Records

Describe in detail all facts which establish that a violation did occur. Enter the name of the railroad official who is custodian of the locomotive records and where the records are retained.

19. Additional Information

Enter any additional information which might be beneficial to establishing the violation. Attach documentation and photographs.

Safety Appliance Violation Form F 6180.29

This form shall be completed for each violation of 49 CFR 231, Safety Appliance Standards.

INSTRUCTIONS:

1. Report Number

The Inspector submitting the violation enters a number which is in sequential MP&E order commencing with 1 and continuing on until his or her service is ended.

2. Name of Inspector

Enter the initials and last name of Inspector(s) submitting the violation report.

3. Operating Railroad

Enter the corporate name of the railroad which is in violation.

4. Date of Violation

Self explanatory.

5. Time of violation

Self explanatory.

6. Station

Enter the city and state where the inspection took place.

7. Division

Enter the division of the operating railroad where the inspection was conducted.

8. Track Number

Identify the track the car was on at the time of the violation.

9. Yard

Identify the yard or facility where the inspection was conducted.

10. Locomotive Initials and Number

Enter the lead locomotive's initials and number; indicate the number of locomotive units in the consist.

11. Train Number

Enter the train's number or symbol. If train is an extra, use the lead locomotive's number preceded by an X. Place the appropriate letter at the end of the number to indicate the train's direction of travel. (X3527E)

12. Repair Facilities Available

Indicate if the required repairs could have been made where the inspection was conducted.

13. Position of Vehicle or Train With Relation To Some Fixed Object

Identify the track and the car's distance from a fixed object when first inspected and at the time of the violation.

14. Description of Movement Constituting Violation

Describe the movement of the car which established the violation.

15. Description

Enter the freight car type.

16. Initials and Number

Self Explanatory.

17. Name and Type or Description of Appliance

Identify the safety appliance that is defective.

18. Location

Using the AAR convention, identify where the defective safety appliance is located on the freight car.

19. Description of Defect

Describe the defective condition of the safety appliance.

20. If Coupler Involved, Could Car Be Uncoupled Without Entering Between Cars

Place check in appropriate box.

21. If Height of Drawbar Involved, Give: Total height from the top of the rail to the center of the coupler knuckle.

Enter the total height of the drawbar from top of rail. Enter gage of the track for purposes of identification as standard or narrow gage track.

22. Was Defect Old or New

Place check in appropriate box.

23. Was Car Marked For Repairs or Bad Ordered

Place check in appropriate box.

24. How Long Had Car Been At Place of Violation

Enter the length of time the car had been at the location where the violation was discovered.

25. Initials, Number and Description of Adjoining Cars

Enter the initials, number, and type of car coupled to the A and B end of the car which is in violation.

26. Did Car Contain Livestock or Other Perishable Freight

Place check in appropriate box.

27. Remarks and Sketches

Describe in detail how the car was used to warrant a violation.

Enter the date, time, name, and title of the railroad representative notified of the violation.

Identify all attachments.

28. Date of Report

Self explanatory.

29. Signature of Inspector(s)

Self explanatory.

NOTE - If photographs are used, they must clearly show the defect as a defect. Also, use a separate unique photograph for each defect and use only one photograph for each defect.

Safety Appliance Violation Air Brake Supplement Form F 6180.29a

This form must be used to report each violation of 49 CFR 232, Railroad Power Brake Standards.

INSTRUCTIONS:

1. Continuation of Inspector's Report Number

Enter the same violation report number which was entered on Form FRA F6180.29 block 1.

2. Name of Inspector(s)

Enter the initials and last name of Inspector(s) submitting the violation report.

3. Date of Violation

Self explanatory.

4. Number of Cars (Include Locomotive Units)

Enter the total number of cars in the train including the

total number of locomotives.

5. Air Brakes Operated

Enter the total number of cars equipped with air brakes.

6. Cut-Out

Enter the total number of cars which had the air brake cut out.

7. Non-Air Cars

Enter the total number of cars which were not equipped with air brakes.

8. In-Op

Enter the total number of cars with the air brakes in-operative.

9. Percent Operated

Enter the percentage of cars with operative air brakes.

10. Locomotive Units

In the appropriate boxes, enter the total number of locomotive units equipped with air, nonair, cut-out, or in-op.

10a. Consist And Association of Brakes On Cars In Train

In the first box from the left marked AIR, enter the total number of cars between the locomotive consist and the first car with the defective air brake.

In the first set of boxes from the left marked NONAIR, CUT-OUT, and IN-OP, enter the number of consecutive cars with defective air brakes in the appropriate box.

In the second box from the left marked AIR, enter the total number of cars between the last defective air brake and the next car with a defective air brake.

In the second set of boxes from the left marked NONAIR, CUT-OUT, and IN-OP, enter the number of consecutive cars with defective air brakes in the appropriate box.

Continue this procedure throughout the remainder of the boxes marked AIR and NONAIR, CUT-OUT, and IN-OP.

10b. Total

Enter the total number of cars from the boxes marked AIR, NONAIR, CUT-OUT, and IN-OP.

*This total should equal the same number as in Block 5, Air Brakes Operated.

11. Location in Train of Nonair Cars, Cars with Cut-Out or In-Operative Brakes

Enter the initials and number of each car with defective air brakes and the location of each car within the train consist.

12. Train Brake Test

Starting with the first block from the left: Enter the type of service, train number, lead locomotive initials and number, total number of cars, time the locomotive coupled onto the cars, time the brakes were applied, time the brakes were released, and the time the train departed.

Indicate the type of repair facility available and the type of air brake test required.

13. State Facts Which Determine Type of Test Required

Describe the events which would establish the type of brake test required.

14. Section and Sub-Section of Order Violated

Enter the appropriate 49 CFR part, subpart, and section.

15. Was Yard Test Plant Available For Use

Place check in appropriate box.

16. Was It Used

Place check in appropriate box if applicable.

17. In-Date-Test reference no longer applies.

18. State All Facts Necessary To Establish Violation Including The Names and Positions of All Carrier Personnel Who Were Present or In The Immediate Vicinity During Brake Test, and Indicate What Each Person Did

Self explanatory.

19. Date of Report

Self explanatory.

20. Signature of Inspector(s)

Self explanatory.

Transmittal of Violation Report - FRA F 6180.72c

A Transmittal of Violation Report (F 6180.72c) must be completed for each violation report submitted. The form should be placed on top of the violation report, and forwarded to the Supervisory Specialist for his review. The supervisory specialist shall specify the method of transmittal. Do not separate the four copies.

Item 1. Enter an "X" in the correct space. Top Priority should only be used for those situations involving imminent danger of death, or flagrant violations requiring immediate processing by Chief Counsel. A memo must be prepared giving the reasons for this classification.

Participating State Inspectors should place an X in the second block to indicate they are a State Inspector.

Item 2. Fill in the type of violation from the four codes available.

Item 3. Inspector filing the violation - name and payroll identification number.

Item 4. Sequential Violation Report Number. No initials or other letters are to be used, just the number. A transmittal report must be made out for each violation report number submitted.

Item 5. Enter the corporate name and approved alphanumeric code of the railroad, or name of the individual in the case of an Individual Liability violation.

Item 6. **CHOOSE ONE ONLY:**

These violations Are Neither Intentional Nor Knowing and Willful. Self explanatory. This may include any type of violation, FCSS, LI, GS, SA, or Power Brake, which occurred due to negligence.

See the explanation of intentional in the next section. NOTE: Failure to perform an Initial Terminal Brake Test should be indicated by choosing the last item.

All Violations Are Knowing and Willful: (SA Only) FRA considers a "willful" violation to be one that is an intentional, voluntary act committed either with knowledge of the relevant law or reckless disregard for whether the act violated the requirements of the law. Accordingly, neither a showing of evil purpose (as is sometimes required in certain criminal cases) nor actual knowledge of the law is necessary to prove a willful violation, **but a level of culpability higher than negligence must be demonstrated.**

All Violations Are Intentional: (FCS, GS, LI: The above explanation of "Knowing and Willful," applies to this section as well. Intentional Safety Appliance defects are indicated above. FCSS, GS, and LI violations would be shown in this section.

Maximum Penalty Requested for Each Violation: If the circumstances are such that the Inspector determines a maximum penalty is justified, but the violation was not intentional, knowing, or willful, this choice should be selected. Ex: A carrier fails to correct a recurring problem that an FRA Inspector has brought to their attention.

Maximum Penalty Requested Due to Failure to Properly Perform an Initial Terminal Air Brake Test: FRA has recognized the critical importance of initial terminal air brake test and inspections as a means of achieving railroad safety. As a result, penalty assessments for violations of the Power Brake Rules requiring an initial terminal air brake test will not be compromised except in compelling circumstances.

Item 7. This section shall be filled out using appropriate codes from the CFR Appendix Section following each section, titled "Schedule of Civil Penalties.

Note - If the five lines of blocks provided are not enough for all counts in the violation, use Transmittal Memo Supplement (FRA F 6180.72f).

Item 8. Generally, the assessment will be one day or one haul. If the Inspector recommends more than one day or one haul, then the number of days or hauls must pertain to all defects listed as part of item 7.

Item 9. Location of the violation, e.g., State, City or County. Use the same codes as used on inspections.

Item 10. Date when the violation first occurred. When a violation is assessed for multiple days, only the first day the violation occurre is listed on this line.

Item 11. When the violation is the result of a complaint driven investigation, enter the complaint file number.

Item 12. When a witness statement is included with a violation place an "X" one line 12.

Item 13. Blank

Item 14. Related violations should contain the inclusive numbers of violations arising from defects found on the same train or locomotive consist and carried on the same inspection report.

Item 15. If the violation report is being resubmitted after previously being declined by the Office of Chief Counsel, place an "X" on line 15.

Item 16. Blank

NOTE - Related Violation Reports should be transmitted together.

How to Document Violations to Stand-Up during Claims Collection

Due to higher FRA penalty schedules, railroads are carefully scrutinizing each violation for weaknesses to use to eliminate or to mitigate the fine. Railroad technical and legal staffs often collaborate long ahead of a claims collection proceeding to prepare a legal defense for each violation covered during the proceeding.

The key to a violation that can not be legally refuted by a railroad is clear, complete and accurate documentation which

forms a complete description and history of the enforcement action taken as a result of the offense. The violation report and its supporting documentation must form a "Legal Case File" that contains all the information necessary to establish a violation did, in fact, occur. This "Legal Case File" should contain the following essential documentation:

- Violation Transmittal Form 6180.72C
- Violation Report Form(s) 6180.10-68
- Inspection Report Form 6180.59
- Photographs or sketches which show the non-complying condition (are in most instances mandatory)
- Witness Statements, if available
- Copies of railroad records which support or establish the violation
- A clear and complete description of the capabilities of any railroad mechanical facilities which played a role or should have played a role in the violation.

A violation supported by a "Legal Case File" containing complete and accurate copies of all this documentation is rarely challenged by a railroad.

Supervisory Review of the Violation Legal Case File

The Regional MP&E Specialist and the Regional Director shall review each MP&E violation legal case file for: errors and/or omissions, correct technical terms, correct format, correct grammar and spelling and to make sure the case file represents a strong legal case against the offending railroad.

If the supervisory review determines the legal case file needs to be corrected or strengthened, the Specialist shall work with the Inspector to be sure the deficiencies in the documentation are corrected. The final authority on whether to send the violation to headquarters for prosecution rests with the Regional Director or his designee.

Once the Region is satisfied the legal case file for the violation is adequate, the Violation Transmittal Form (FRA F 6180.72a) shall be correctly signed and used to transmit the legal case file to headquarters. The original and one copy shall be submitted to the Assistant Chief Counsel for Enforcement. One copy shall be submitted to the Office of Safety Enforcement, RRS-10. One copy should be filed at the Regional Headquarters.

Lessons Learned During Claims Collection Proceedings

The following are some specific lessons learned during past claims collection proceedings which will help Inspectors document violations so they can not be successfully challenged:

- Whenever possible, take photographs. When photographic evidence, labeled with essential text, clearly shows the defect upon which the violation is based, it often makes the case. Each violation report should include a photograph (not a photocopy of a photograph) mounted on a sheet of 8 1/2" x 11" paper. The photograph should be labeled with:
  1) the Inspector's name
  2) the violation number
  3) the date
  4) the identification number of the defective equipment
  5) the offending railroad
  6) the number of the train which included the defective equipment
  7) the location and clear description of the defect or non-complying condition.

- Use the exact same photograph for each of the four copies of a violation, but do not use the same photograph or copies of the same photograph to document more than one violation. Take a separate, obviously unique photograph to document each violation.

- Cracks covered by chalk or crayon often do not photograph well. Take a photograph of the crack as is before attempting to highlight it.

- If a photograph can not be taken or does not clearly depict the defect, include a neat, accurate sketch that identifies the component and defect location. Label the sketch with the same information as a photograph. Do not use photographs which do not clearly depict the defect. Such photographs weaken the case. Use a sketch instead. Photocopies from technical manuals or other manufacturer's literature can often be used as the starting point for an effective sketch of the defect.

- Refer to the specific and correct regulation which has been violated. Refer to the CFR to be sure. **Do not use defect codes** in reference to violations. Defect codes are not part of the regulations. Railroads frequently avoid an otherwise valid violation because

of an incorrect reference to the CFR section in the violation documentation.

- Use the same adjectives as used in the CFR to describe the defect.

- Violating in-bound trains is difficult. The supporting documentation must establish the train was defective as it departed a point where repairs could have been made. The documentation must eliminate the possibility of the defect occurring while the train was enroute.

- Carefully define and document the status of the defective equipment. Railroads often avoid an otherwise valid violation by claiming the defective equipment was not in service. This is particularly true with locomotives. Obtain railroad records which document use or movement. This type documentation is very powerful and often makes the case. Be sure the locomotive daily inspection report is completely filled out. Try to establish the equipment was assigned to a train and include the train number. Record the time, the location and the name and title of railroad officials who indicated the equipment was ready for service.

- Violations for locomotives overdue for daily inspection must include documentation of use on days in question when no inspection was performed.

- Be specific about how measurements were taken. For measurements taken with a gauge, do not quantify the measurement. Describe the gauge used and record the fact the equipment failed the go/no go criteria of the gauge. For measurements made with a rule or tape, record the quantified measurement. Be sure to state the quantified measurement exceeded a limit specified in the CFR. Often violations are written for violations equal to a limit specified in the CFR. These violations will be thrown out during claims collection.

- When possible, using the procedures given in this manual, take witness statements. Establish the credibility of the witness and be sure the statement specifically refers to and describes the defective condition.

- When using a copy of the railroad's billing repair record to support the violation, be sure all AAR or railroad codes actually identify the nature of the repair. Also, include an explanation of the codes used.

- Describe the capabilities of any railroad mechanical facilities which are involved in the case. Include a description of the work normally done at the facility. Also, describe the knowledge and skills of the people employed at the facility.

- Document how the railroad was notified of the violation. Include when notification was given and to whom it was given.

- Carefully proof read all documentation included in the case file. A little extra care will prevent the violation from being reduced or terminated on a technicality such as a typographic error.

- Do a follow-up inspection on the equipment or the railroad's records after assessing the violation to determine if appropriate repairs were made to the equipment. Include the results of the follow-up inspection in the case file.

The quality of the documentation supporting violations is a measure of the credibility and respect Inspectors will establish with the railroads. The quality of this documentation is also an important factor in the effectiveness of the FRA safety enforcement program. Many railroads are establishing data bases on FRA/State Inspectors. Much of the information in the data base is based on the type and the quality violations each Inspector submits. You should strive for their bottom line on you to be professional, effective and fair. To be effective, you must be consistent, you must comply with all relevant Federal regulations and procedures, but you must not be predictable.

Special Notice For Repairs - F 6180-8

When an FRA Motive Power and Equipment Inspector determines that a railroad freight car does not conform to the requirements of the FRA Freight Car Safety Standards set forth in part 215, or a locomotive is not safe to operate in the service to which it is put, whether by reason of nonconformity with the FRA Locomotive Inspection Regulations set forth in part 229 or by reason of any other condition rendering the locomotive unsafe, the inspector notifies the railroad in writing that the car or locomotive is not in serviceable condition. After receipt of the Special Notice, the railroad shall remove the car or locomotive from service until it is restored to serviceable condition. The car may not be deemed to be in serviceable condition until it

complies with all applicable requirements of part 215. The locomotive may not be deemed to be in serviceable condition until it complies with all applicable requirements of part 229 and until all additional deficiencies in the Special Notice have been corrected.

Note: **If a "Special Notice For Repairs" (FRA Form F6180.8) is issued the appropriate violation report form shall also be prepared and submitted.**

NOTE: Form F 6180.8 in the upper left hand corner of the box containing the title, **"SPECIAL NOTICE FOR REPAIRS"** Part 1, the inspector will number the Form 8 by entering first the region number and then assign a number which is in sequential order commencing with 1 and continuing on until his or her service is ended. The inspector shall also include the number in the same location in the box entitled **"SPECIAL REPAIR REPORT"** Part 2.

49 CFR, Part 216 Subpart B; section 216.11 provides guidance in issuing a "Special notice for repair" (FRA Form F6180.8) - railroad freight car -

When an FRA Motive Power & Equipment Inspector or a State Equipment Inspector determines that a railroad freight car is not in conformity with the requirements of the Freight Car Safety Standards set forth in Part 215 and that the freight car is unsafe for further service, the inspector notifies the railroad in writing that the car is not in a serviceable condition.

The "Special notice for repair" (FRA Form F6180.8) sets out and describes the defects that cause the car to be in an unservicable condition. Only those conditions for which the the "Special notice for repair" was issued shall be shown on the "Special notice for repair" (FRA Form F6180.8).

A railroad freight car subject to the notice **may be moved from the place of where it was found to be unsafe for further service to the nearest available point where the car can be repaired,** if such movement is necessary to make such repairs. However, the movement is subject to the restrictions of 215.9.

Note: **"nearest available point"** means a location where repairs of the non-complying condition required can be safely made. This location need not be a car repair facility, it may be a location where a mobile repair vehicle can effectively make repairs.

Section 216.13 provides instructions for issuing a "Special notice for repair" (FRA Form F6180.8) - locomotive.

When an FRA Motive Power & Equipment Inspector or a State Equipment Inspector determines that a locomotive is not safe to operate in the service in which it is put, whether by reason of nonconformity with the FRA Locomotive Inspection Regulations set forth in part 229 of this chapter or by reason of any other condition rendering the locomotive unsafe, he notifies the railroad in writing that the locomotive is not in servicable condition. After receipt of the Special Notice, the railroad shall remove the locomotive from service until it is restored to servicable condition. The locomotive may not be deemed to be in servicable condition until it complies with all applicable requirements of part 229 of this chapter and until all deficiencies identified in this Special Notice have been corrected.

The "Special notice for repair" (FRA Form F6180.8) sets out and describes the defects that cause the locomotive to be in an unservicable condition. Only those conditions for which the "Special notice for repair" was issued shall be shown on the "Special notice for repair" (FRA Form F6180.8).

A reminder that when a "Special notice for repair" (FRA Form F6180.8) is issued the appropriate violation report shall also be prepared and submitted.

Instructions for completing the "Special Notice for Repair" (Form FRA f 6180.8)

Example: #1 - initials -#1 (Form 8)
" signature & ID xxxxx (Form 8)

Additionally, the inspector shall include his or her identification number after the signature in the lower left hand corner of the Form 8 and on the line over the title **SPECIAL REPAIR REPORT** on the Form 8 A.

Example: #1 - initials -#1 - ID xxxxx (Form 8 A)

Form FRA F6180-8

Item 1. Railroad: Enter the corporate name of the railroad.

Item 2. Name: Enter Official's name to whom this form is submitted.

Item 3. Title: Enter Railroad Official's Title.

Item 4. Location: Enter the city, state, and station or terminal where the Special Notice was issued.

Item 5. Date: Date of this form.

Item 6. Time: Time this form filled out.

Item 7. Check One: Place a check mark in the first box at the left margin. Also enter the locomotive number in the appropriate space. Move to Item 8.

Item 8. Defects: Only the defects that render the car or locomotive unsafe to operate in the service to which it is put are to be listed **under item 8 (Defects Example: The letter "F" missing from the front of a locomotive would not be listed under item 8, however, a broken wheel would be listed.)** The first defect listed should be the most serious or dangerous defect followed by other defects in descending order of seriousiness.

At the left margin, number the defect entries consecutively, starting with (1), then enter a description of the defect; and at the end of the line enter the appropriate section number, such as 229.75(a), for a flat spot.

Sign the form in the lower left corner and record identification number.

Enter the Regional Director's name and address in the block at the lower right corner of the form.

In the event that additional space is required, use another Form 6180.8; as there is no continuation sheet. When it is necessary to do this the pages should be numbered in the upper right corner.
(Example: Page 1 of 3 pages.)

Special Repair Report - F 6180-8a

When a Special Notice is issued the Inspector should provide the railroad with sufficient copies of **Form F 6180-8a -**

Special Repair Report - Part 2; which the railroad must submit to FRA when the locomotive or freight car is returned to service.

The inspector should enter the Regional Headquarter address on the franked side of the F 6180-8a.

The Inspector should also complete the top section of Item 5, entering his name, date and time Form 8 was issued, and the locomotive or freight car number.

Explain to a railroad representative the proper method of completing the form. Carriers frequently fail to properly complete Item 5.

Item 5. The railroad should enter a description of the **repairs** made to the locomotive or freight car. This entry should <u>not</u> be a description of the defects.

Each descriptive repair entry should be numbered, corresponding to the numbered defect entries on the Special Notice.

Item 6. Name and Title of the railroad officer who certifies the information on the Form 6180-8a is correct.

Item 7. Signature of Officer in Charge of Repairs certifying the listed defective conditions have been brought into compliance with the Code of Federal Regulations.

Item 8. Signature of Chief Mechanical Officer/Chief Engineer.

Item 9. State (Location of Chief Mechanical Officer/Chief Engineer).

Item 10. County (Location of Chief Mechanical Officer/Chief Engineer).

Item 11. The railroad shall notify the FRA Regional Director of Railroad Safety in writing when the locomotive is returned to service, specifying the repairs completed. The railroad employee directly responsible for the repairs shall sign the form.

Locomotive Compliance Review Inspection Summary

Inspectors will ocassionally participate in locomotive compliance reviews. These reviews are intensive inspections of the locomotives at a particular railroad or site to determine how well that railroad or site complies with Federal locomotive safety standards. All of the forms normally used by inspectors will be used to report the detailed results of locomotive compliance review inspections. In addition the results of the compliance review must be summarized using the two locomotive compliance review summary forms which follow.

Freight Car Compliance Review Enforcement Summary

Inspectors will occassionally participate in freight car compliance reviews. These reviews are intensive inspections of freight cars at a particular railroad or site to determine how well that railroad or site complies with Federal freight car safety standards. All of the forms normally used by inspectors to report the results of freight car inspections will be used to report the detailed results of the complince review. In addition, the results of the freight car compliance review will be summarized on the summary form which follows.

WAIVERS-INSPECTORS' REPORT FORMS FOR MP&E PETITIONS

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
Inspectors Report Form for MP&E Petitions

Petition Number_____Date filed_____

From
Inspector:_____Place_____Date_____

Railroad filing
petition:_____

Inspection: Railroad Representative Name and
Title_____
_____ Date _____ Location_____

Furnish the following information:

(a) Provide a description of proposed changes or relief sought, locations with respect to place and distance between designated points is correctly stated in Public Notice____, or should be changed to read as follows:____:

(b) Name of any other railroads affected by proposed changes not shown in Public Notice and manner in which each is affected:

(c) 1. Description of motive power or equipment involved.

2. Describe condition of motive power or equipment relative to compliance with 49 CFR, Parts 215, 229, 231, and 232.

3. Description of the operations for which the waiver of compliance is sought.

4. Information relative to the proposed relief not fully described in the Public Notice.

5. Present method of operation, number of trains or other movements per day, and speed authorizations and restrictions.

6. Summary of accident/incident reports reviewed relative to the proposed relief.

7. Other pertinent facts or remarks.
(Use additional sheets numbering 1a, 1b, 1c, etc)

(d) List of any prints, bulletins, orders, timetables, etc., obtained during investigation:

(e) List the specific sections from which relief is sought (e.g. 49 CFR 229., 223. etc).

1. Reasons proposed relief is necessary.

2. If any of the proposed changes have been placed in service, give description of such changes, date such changes were placed in service and the reasons for making the changes before the approval of the petition.

(f) Inspector's analysis: The proposed relief will (check one)

___ Reduce protection and safety
___ Provide adequate protection for existing and operating conditions without materially reducing safety
___ Maintain existing protection and safety
___ Increase protection and safety

State reasons:

(g) Inspector's recommendation as to disposition of this application. State reasons:

_____ (Inspectors Signature)

Report of Interview

Reports of interview should be conducted with the following format:

Step 1.

Person Interviewed: Name, Title.

Date and time of Interview: Today's Date and Time.

Method of Interview: State where and how the interview was conducted.

(Example; FRA Office, Blue Springs, Mo.
Via telephone).

Interviewed by: Name and Title of person(s) conducting interview.

Step 2.

This is a report of interview and should be written as such. The conditions, circumstances and/or events described in the body of the report of interview should not be used as a witness statement.

Reports of Interview are generally used in a third person narrative. The example is as follows: In third person narrative the text would read as follows: "Mr. Smith stated that he was standing beside the railroad track when he saw the train depart without a proper train air brake test".

Witness Statement

A. When testimony of a witness is vital to the investigation and the investigator has determined that it is necessary to corroborate the facts, a written statement signed and properly witnessed should be obtained whenever possible.

B. The following outline should be used for the purpose of procuring witness statements.

1. The statement should be captioned: Statement of(Witness Name)

2. The statement should contain the date, time, and place where the statement is taken. The statement must also show the full name of the witness, address and occupational duties.

3. The statement should state that the statement was voluntarily made without coercion, threats or promises by the investigator. (whose name should be recorded in the body of the text). Additionally, the names of all persons in attendance shall be recorded on the statement.

4. The statement taken may be in the form of questions by the investigator and answers by the witness or it may be in the form of a written narrative by the witness. The question and answer method is recommended when the witness lacks the ability to express himself.

5. Remember that it is a statement of the witness and not of the investigator. The text should emulate the style of the witness' vocabulary and use his terms and expression.

6. The statement should include only the facts that are pertinent to the particular incident.

7. It must be confined to things which the witness has actual knowledge and not hearsay.

8. If the witness mentions other persons in the statement, such persons should be identified by name, address, business occupation, etc. when possible.

9. The closing paragraph should state the witness has read the statement and that it is true and correct to the best of their knowledge and belief.

10. If the statement is changed in any manner after it

has been written in longhand by the witness, the changes must then be initialed and dated by the witness, directly over the changes. If the statement is given verbally by the witness to the investigator and then typed, or if the statement is written in longhand by the witness and then typed, the witness should read the statement carefully before signing the statement.

11. The statement should be signed by the witness in the presence of the investigator and witnessed by another person if present. The investigator may witness the signature.

12. Important--If the witness declines to sign, the unsigned statement should be transmitted with the final report with an explanation as to the reason for refusal.

If the witness refuses to sign the statement, the investigator should try to determine the reason for refusal. The witness just may have changed his mind in giving a statement. If the witness orally states that the statement is true and correct. The unsigned statement then has evidentiary value in the case.

(C) Recommended form of statement is as follows:

Step 1.

FEDERAL RAILROAD ADMINISTRATION
STATEMENT OF WITNESS TO SAFETY VIOLATION

I, (The witness), make the following voluntary statement to, (The Investigator), who has been identified to me as an Inspector of the Federal Railroad Administration. No threats or promises have been made to induce me to give this statement. I understand that a copy of this statement will be provided to counsel for the railroad and/or shipper involved when and if a civil penalty is demanded for a violation of the railroad safety laws based in whole or in part on this statement. If it subsequently becomes necessary for the Federal Railroad Administration to initiate an administrative hearing or to bring suit to collect such a penalty, I will testify to the facts set forth below in that hearing or lawsuit.

I understand that section 212 of Federal Railroad Safety Act makes it illegal for a common carrier by railroad to discharge or in any manner discriminate against any employee because that employee (1) filed any complaint, and/or instituted or caused to

be instituted any proceeding under or related to enforcement of federal railroad safety laws, or (2) testified or is about to testify in any such proceeding. I also understand that any dispute, grievance, or claim that may arise under section 212 will be resolved under the procedures of the Railway Labor Act.

Step 2.

Insert Narrative as prescribed in Sections B. 4. through B. 10.

Step 3.

I have read the above statement and certify that it is all true and correct to the best of my knowledge.

Witness Signature: _____
Date:_____

Signed in the presence of investigator(inspector): _____
_____
Federal Railroad Administration. Date:_____
_____

Witnessed by:_____ Title:_____
_____

Date:_____

Chapter 6

Railroad Freight Car Safety Standards

Introduction

In accordance with the provisions of the **Federal Railroad Safety Act of 1970**, the "Railroad Freight Car Safety Standards" 49 CFR, Part 215, was issued on November 12, 1973 and became effective January 1, 1974. The Federal Railroad Administration (FRA) anticipated these new regulations would reduce the number of railroad accidents and reduce accident costs to the industry. Since their inception, there have been several amendments to Part 215.

The railroad industry is constantly changing and FRA recognizes additional amendments may be needed to address these changes. New technology in high speed rail will demand changes in current regulations. Effective January 1, 1992, AAR interchange rule 88, requires that all Hazardous Material tank cars in service must be equipped with roller bearings. Further, effective January 1, 1994, **all** freight cars must be equipped with roller bearings. Additionally, the number of articulated cars presently in service and new concepts in freight car construction may require changes in present regulations.

Federal and State Inspectors must be able to assess an ever increasing variety of conditions and ascertain the necessity and type of corrective procedures to be initiated. Under certain conditions it may not be warranted to cite a railroad for a single defect on a freight car, although § 215.7, "Prohibited acts" provides strict liability.

Motive Power and Equipment Inspectors must determine whether conditions observed acutely impact on the safe operation of the freight equipment. When freight equipment is inspected and deficiencies exist that may not be conducive to safe rail operation, the Inspector must decide whether the defect:

- is encompassed in Federal regulations (e.g., meets the definition of what constitutes a Federal defect).
- should be included in the Motive Power and Equipment Report (F 6180.59).
- warrants the issuance of a violation.
- should be reported to the railroad as an unsafe condition which is not encompassed in Federal regulations.

Federal Railroad Administration

The following brief discussion summarizes guidelines to be used by Federal and State Inspectors to conduct field inspections for compliance or enforcement activity. Enforcement policies, must be adhered to by each Inspector conducting inspections of locomotives, passenger cars, or freight cars or observing train air brake tests. From the outcome of the inspection each Inspector must determine whether each unit inspected, tested, maintained, or operated by railroad personnel, complies with Federal safety requirements.

When Inspection reveals a non-complying condition, the Inspector must examine and determine the particular details of the condition in order to assess whether it conforms with interpretations of Federal regulations for those types of non-complying conditions. Before recording the condition as a defect, the inspector must weigh each essential factor to determine whether the condition meets, exceeds or is in fact, a non-complying condition under the Federal regulations. If the Inspector determines that a condition is unsafe or creates an eminent hazard, and is not covered by Federal regulations, he\she should inform the responsible railroad official for corrective action.

Furthermore, when a measurement is required to determine compliance or non-compliance, and such measurement can not be accurately stated as meeting or exceeding those measurements contained in the applicable regulation, then that condition may not be reported as a defect.

When the Inspector ascertains and documents that a freight car is conclusively in non-compliance with Federal Regulations, he should contemplate filing appropriate reports. To determine what enforcement action to employ, the Inspector should consider the compliance history at the location, and whether or not the railroad immediately initiates corrective action. The submission of a violation report may be warranted.

Additionally, if the Inspector makes a determination that a freight car is in non-compliance with Federal regulations, and is unsafe and not in a serviceable condition, he may issue a **Special Notice For Repair** to the railroad. The Inspector should consider the compliance history and the seriousness of the circumstances and substantiate each of the conditions that are enumerated in the notice.

The inspection of freight cars that have been **repaired and released** by car repair facilities should be done on a regular basis. These freight cars should be suitable for service and essentially defect free.

Any railroad employee who authorizes a willful movement or operation of non-complying or unsafe equipment and has knowledge of the circumstances can be held personally responsible for such action. Inspectors should carefully weigh all pertinent facts before considering a willful violation of Federal regulations. Prior to advising a railroad

employee that he/she will be cited for a willful violation, the Inspector must communicate with the Regional Office (see General Manual).

The Motive Power and Equipment Inspector major duties:

- Monitor railroad compliance with the freight car safety standards.
- Inspect freight cars to appraise their condition.
- Encourage the railroad to correct non-complying conditions.
- Endeavor to have the railroad perform proper inspection and maintenance practices which enhance compliance with applicable regulations.
- Maintain timely and accurate records.

At locations where *designated inspectors* are assigned to perform inspections to determine compliance with Railroad Freight Car Safety Standards, the cars should be free of noticeable defects, e.g., excessively worn wheels, or obvious draft, body, and truck defects. When defective conditions such as these are found, it may warrant the submission of a violation or even the issuance of "Special Notice For Repair", depending on the circumstances. If the car is deemed to be unsafe for further service and is due to be hauled by a railroad, a "Special Notice For Repair" (FRA F 6180.8) should be issued by the Inspector. This will notify the railroad that the Inspector considers the movement of the defective to be unsafe. The railroad must remove the car from service until it is repaired.

Freight Car Safety Standards Inspection Procedures

Upon arrival at an inspection point, the Inspector should notify the local railroad representative of his/her presence and intentions. Determine what equipment will be inspected and ask the representative if they plan to accompany you. However, if an inspection is related to a complaint, it may not be desirous to be accompanied. The Inspector should, in most cases, be accompanied by a railroad representative and should be properly attired and comply with the railroad's safety requirements (e.g., safety glasses, hard hat, etc.). Inspectors should also have in his\her possession the necessary gauges, flashlight, ruler and\or tape measure and copy of regulations.

It is not necessary for FRA/State Inspectors to obtain "blue signal" protection in order to perform inspection activity; however, Inspectors should never place themselves in a position where the movement of equipment subjects them to the danger of personal injury. Railroad representative(s), accompanying the Inspector during the inspection,

must obtain blue signal protection if that individual engages in activities that require them to work on, under, or between the equipment.

The inspection should preferably start on the end of the car. The entire car must be inspected for compliance with all applicable regulations (215, 231 and 232).

The railroad representative should be advised of all non-complying conditions disclosed by the inspection. When the inspection is completed, the Motive Power and Equipment Inspection Report (F-6180.59) must be completed and the appropriate copy left with the railroad representative. The railroad representative should acknowledge receipt by signing the report. If for any reason the inspection report can not be completed immediately after the inspection, it must be completed and mailed to the railroad representative within 24 hours.

Regulation

PART 215 - Railroad Freight Car Safety Standards

Subpart A - General

Sec.

Subpart B-Freight Car Components

Suspension System

Car Bodies

Draft System

Subpart C - Restricted Equipment

Subpart D - Stenciling

AUTHORITY: 45 U.S.C. 431 and 438, as amended; Pub. L. 100-342; and 49 CFR 1.49(m).

SOURCE: 44 FR 77340, Dec. 31, 1979, unless otherwise noted.

Federal Railroad Administration

Subpart A-General

§ 215.1 Scope of part

This part prescribes minimum Federal safety standards for railroad freight cars.

§215.3 Application

(a) Except as provided in paragraphs (b) and (c) of this section, this part applies to each railroad freight car in service on:
  (1) Standard gage track of a railroad; or
  (2) Any other standard gage track while the car is being operated by, or is otherwise under the control of a railroad.

(b) Sections 215.15 and 215.303 of this part do not apply to any car:
  (1) Owned by a Canadian or Mexican Railroad; and
  (2) Having a Canadian or Mexican reporting mark and car number.

(c) This part does not apply to a railroad freight car that is:
  (1) Operated solely on track inside an industrial or other non-railroad installation; or
  (2) Used exclusively in dedicated service as defined in §215.5(d) of this part; or
  (3) Maintenance-of-way equipment (including self-propelled maintenance-of-way equipment) if that equipment is not used in revenue service and is operated at speeds of less than 20 miles per hour, and is stenciled in accordance with §215.305 of this part.

§ 215.5 Definitions.

As used in this part:
(a) *Break* means a fracture resulting in complete separation into parts;

(b) *Cracked* means fractured without complete separation into parts, except that castings with shrinkage cracks or hot tears that do not significantly diminish the strength of the member are not considered to be "cracked";

(c) *Railroad freight car* means a car designed to carry freight, or railroad personnel by rail and includes a:
(1) Box car;
(2) Refrigerator car;
(3) Ventilator car;

(4) Stock car;
(5) Gondola car;
(6) Hopper car;
(7) Flat car;
(8) Special car;
(9) Caboose car;
(10) Tank car; and
(11) Yard car.

(d) *Dedicated service* means the exclusive assignment of cars to the transportation of freight between specified points under the following conditions:
(1) The cars are operated-
(i) Primarily on track that is inside an industrial or other non-railroad installation; and
(ii) Only occasionally over track of a railroad;
(2) The cars are not operated-
(i) At speeds of more than 15 miles per hour; and
(ii) Over track of a railroad-
(A) For more than 30 miles in one direction; or
(B) On a round trip of more than 60 miles;
(3) The cars are not freely interchanged among railroads;
(4) The words "Dedicated Service" are stenciled, or otherwise displayed, in clearly legible letters on each side of the car body;
(5) The cars have been examined and found safe to operate in dedicated service; and
(6) The railroad must-
(i) Notify the FRA in writing that the cars are to be operated in dedicated service;
(ii) Identify in that notice-
(A) The railroad affected;
(B) The number and type of cars involved;
(C) The commodities being carried; and
(D) The territorial and speed limits within which the cars will be operated; and
(iii) File the notice required by this paragraph not less than 30 days before the cars operate in dedicated service;

(e) *In service* when used in connection with a railroad freight car, means each railroad freight car subject to this part unless the car:
(1) Has a "bad order" or "home shop for repairs" tag or card containing the prescribed information attached to each side of the car and is being handled in accordance with § 215.9 of this part;

(2) Is in a repair shop or on a repair track;
(3) Is on a storage track and is empty; or
(4) Has been delivered in interchange but has not been accepted by the receiving carrier.

(f) *Railroad* means all forms of non-highway ground transportation that run on rails or electromagnetic guide-ways, including (1) commuter or other short-haul rail passenger service in a metropolitan or suburban area, and (2) high speed ground transportation systems that connect metropolitan areas, without regard to whether they use new technologies not associated with traditional railroads. Such term does not include rapid transit operations within an urban area that are not connected to the general railroad system of transportation.

(g) *State inspector* means an inspector who is participating in investigative and surveillance activities under section 206 of the Federal Railroad Safety Act of 1970 (45 U.S.C. 435).

[44 FR 77340, Dec. 31, 1979, as amended at 45 FR 26710, Apr.21, 1980; 54 FR 33228, Aug. 14, 1989]

§ 215.7 Prohibited acts.

Any person (including a railroad and any manager, supervisor, official, or other employee or agent of a railroad) who violates any requirement of this part or causes the violation of any such requirement is subject to a civil penalty of at least $250 and not more than $10,000 per violation, except that: Penalties may be assessed against individuals only for willful violations, and, where a grossly negligent violation or a pattern of repeated violations has created an imminent hazard of death or injury to persons, or has caused death or injury, a penalty not to exceed $20,000 per violation may be assessed. Each day a violation continues shall constitute a separate offense. See appendix B to this part for a statement of agency civil penalty policy.

[53 FR 28599, July 28, 1988, as amended at 53 FR 52925, Dec. 29, 1988]

§ 215.9 Movement of defective cars for repair.

(a) A railroad freight car which has any component described as defective in this part may be moved to another location for repair only after the railroad has complied with the following:
(1) A person designated under § 215.11 shall determine:
(i) That it is safe to move the car; and
(ii) The maximum speed and other restrictions necessary for safely conducting the

movement;
(2)(i) The person in charge of the train in which the car is to be moved shall be notified in writing and inform all other crew members of the presence of the defective car and the maximum speed and other restrictions determined under paragraph (a)(1)(ii) of this section.
(ii) A copy of the tag or card described in paragraph (a)(3) of this section may be used to provide the notification required by paragraph (a)(2)(i) of this section.
(3) A tag or card bearing the words "bad order" or "home shop for repairs" and containing the following information, shall be securely attached to each side of the car-
(i) The reporting mark and car number;
(ii) The name of the inspecting railroad;
(iii) The inspection location and date;
(iv) The nature of each defect;
(v) Movement restrictions;
(vi) The destination for shopping or repair; and
(vii) The signature of a person designated under § 215.11.

(b)(1) The tag or card required by paragraph (a)(3) of this section may only be removed from the car by a person designated under § 215.11 of this part.
(2) A record or copy of each tag or card attached to or removed from a car shall be retained for 90 days and, upon request, shall be made available within 15 calendar days for inspection by FRA or State inspectors.
(3) Each tag or card removed from a car shall contain a notification stating the date, location, reason for its removal, and the signature of the person who removed it from the car. These recordkeeping requirements have been approved by the Office of Management and Budget in accordance with the Federal Reports Act of 1942.

(c) Movement of a freight car under paragraph (a) of this section may be made only for the purpose of effecting repairs. If the car is empty, it may not be placed for loading. If the car is loaded, it may not be placed for unloading unless unloading is consistent with determinations made and restrictions imposed under paragraph (a)(1) of this section and-
(1) The car is consigned for a destination on the line of haul between the point where the car was found to be defective and the point where repairs are made; or
(2) Unloading is necessary for the safe repair of the car.

(d) Nothing in this section authorizes the movement of a freight car subject to a Special Notice for Repairs unless the movement is made in accordance with the restrictions contained in the Special Notice.

[44 FR 77340, Dec. 31, 1979; 45 FR 26710, Apr. 21, 1980]

Federal Railroad Administration

Interpretation

A record of each tag or card attached to or removed from the car shall be retained for 90 days and upon request, shall be made available for inspection by FRA or State inspectors.

Defect Codes

215.009

A. 1. Failure to meet conditions for movement for defective cars for repairs.

A. 2. Failure to prescribe appropriate requirements for movement of non-complying cars.

B. 1. Records inspected for movement of defective cars, (number).

C. 1. Improper or No Record for movement of defective cars for repairs.

D. 1. Records Inspection for repairs made to defective cars.

Regulation

§ 215.11 Designated inspectors

(a) Each railroad that operates railroad freight cars to which this part applies shall designate persons qualified to inspect railroad freight cars for compliance with this part and to make determinations required by § 215.9 of this part.

(b) Each person designated under this section shall have demonstrated to the railroad a knowledge and ability to inspect railroad freight cars for compliance with the requirements of this part and to make determinations required by § 215.9 of this part.

(c) With respect to designations under this section, each railroad shall maintain written records of:
(1) Each designation in effect; and
(2) The basis for each designation.

[45 FR 26710, Apr. 21, 1980]

Interpretation

Each railroad that operates freight cars to which this part applies shall designate persons qualified to inspect railroad freight cars for compliance with this part and to make determinations required by 215.9 of this part.

Defect Codes

215.011 A. 1. Railroad fails to designate qualified persons to inspect freight cars.

A. 2. Persons designated don't have knowledge/ability to inspect cars for compliance with requirement.

B. 1. Railroad fails to maintain written record of each designation in effect.

B. 2. Railroad fails to maintain written record of the basis for this designation.

Regulation

215.13 Pre-departure inspection.

(a) At each location where a freight car is placed in a train, the freight car shall be inspected before the train departs. This inspection may be made before or after the car is placed in the train.

(b) At a location where an inspector designated under § 215.11 is on duty for the purpose of inspecting freight cars, the inspection required by paragraph (a) of this section shall be made by that inspector to determine whether the car is in compliance with this part.

(c) At a location where a person designated under § 215.11 is not on duty for the purpose of inspecting freight cars, the inspection required by paragraph (a) shall as a minimum, be made for those conditions set forth in appendix D to this part.

(d) Performance of the inspection prescribed by this section does not relieve a railroad of its liability under § 215.7 for failure to comply with any provision of this part.

[45 FR 26710, Apr. 21, 1980]

Federal Railroad Administration

Interpretation

Inspection for compliance with all provisions of the Freight Car Safety Standards will be required to be conducted by a *designated inspector* at locations where one is on duty to inspect freight cars. At other locations, a pre-departure inspection shall be made by available personnel for specific conditions listed in Appendix D, i.e., likely to cause an accident or casualty before the train arrives at its destination.

At locations where cars are inspected by railroad personnel who are not *designated inspectors*, the options for handling the defective cars are limited to : (1) Setting the car out or (2) calling in a *designated inspector* to either repair the car or tag it for movement for repair in accordance with § 215.9. The railroad delivering a car in interchange is responsible for that car until the receiving railroad accepts the car by either moving it, or otherwise exercising control over it.

Scenario: An Inspector observes a freight train being assembled but does not witness a railroad employee perform the required pre-departure inspection. The inspector inspects the train and notes two cars with Part 215 non-complying conditions and the train departs with the defective cars left in the train. Should the inspector submit a violation for failure to perform a pre-departure inspection?

Answer - No, a violation should not be submitted for failure to inspect, but may be submitted for the defective condition of the cars.

Defect Codes

Inspection

215.013 A.1. Failure to perform pre-departure inspection.

A.2. Failure to perform Appendix D pre-departure inspection.

Regulation

§ 215.15 Periodic inspection. - This part is no longer applicable

Subpart B — Freight Car Components

§ 215.101 Scope

This subpart contains safety requirements prohibiting a railroad from placing or continuing in service a freight car that has certain defective components.

Suspension System

§ 215.103 Defective wheel.

A railroad may not place or continue in service a car, if-
(a) A wheel flange on the car is worn to a thickness of 7/8 of an inch, or less, at a point 3/8 of an inch above the tread of the wheel;

(b) The height of a wheel flange on the car, from the tread to the top of the flange, is 1½ inches, or more;

(c) The thickness of a rim of a wheel on the car is 11/16 of an inch, or less;

(d) A wheel rim, flange, plate, or hub area on the car has a crack or break;

(e) A wheel on the car has a chip or gouge in the flange that is 1½ inches in length and ½ inch in width, or more;
(f) A wheel on the car has——
(1) A slid flat or shelled spot that is more than 2½ inches in length; or
(2) Two adjoining flat or shelled spots each of which is more than two inches in length;

(g) A wheel on the car shows evidence of being loose such as oil seepage on the back hub or back plate;

(h) A wheel on the car shows signs of having been overheated as evidenced by a reddish brown discoloration, to a substantially equal extent on both the front and the back face of the rim, that extends on either face more than four inches into the plate area measured from the inner edge of the front or back face of the rim; or,

(i) A wheel on the car has been welded unless the car is being moved for repair in accordance with § 215.9 of this part.

[44 FR 77340, Dec.31, 1979, as amended at 50 FR 13382, Apr.4, 1985]

Federal Railroad Administration

Interpretation

Wheel Wear and Cracks

The specified wheel measurements are the minimum safety requirements and are designed to prevent wheel failures. Wheel measurements must be carefully taken to assure accuracy. There is no visual way to determine whether a small crack will or will not propagate to undermine the wheel. Cracks which are found in wheels which extend from the tread outward over the edge of the rim or into the flange should be considered as dangerous to the safety of the wheel and handled for correction with the railroad. Cracks which are observed in the tread area of wheels which measure 1/2 inch or less and do not extend over the edge of the rim or into the flange area are not to be reported as cracked wheels. However, if any of these 1/2 inch cracks appear to be opened, it should be reported because the wheel has gone into a state of tension and any further thermal abuse may result in a broken wheel. These cracks are often referred to as thermal checks and result from high temperature during braking. Heat checks or chips in the tread area generally do not indicate a weakness of the material that would result in a failure of the wheel.

Overheated wheels

The reddish brown discoloration that extends into the wheel plate more than 4 inches on both sides of the wheel. The 4 inch measurement is to be made from the bottom of the back face of the rim.

A rust condition of the wheel should <u>not</u> be considered as a reddish brown discoloration.

Welded wheels

Regulations allow welding of wheels only as an emergency measure to enable the car to be moved to a repair facility. A welded wheel is not a prohibited defect if the car is tagged and being moved in accordance with § 215.9.

Defect Codes

Wheel Conditions

215.103 A. 1. Wheel flange thickness 7/8" or less at 3/8" above the tread.

A. 2. Wheel flange thickness 13/16" or less at 3/8" above the tread.

A. 3. Wheel flange thickness 3/4" or less at 3/8" above the tread.

B. 1. Wheel flange is 1½" or more from the tread to top of flange.

B. 2. Wheel flange is 1 5/8" or more from the tread to top of flange.

B. 3. Wheel flange is 1-3/4" or more from the tread to top of flange.

C. 1. Wheel rim thickness is 11/16" or less.

C. 2. Wheel rim thickness is 5/8" or less.

C. 3. Wheel rim thickness is 9/16" or less.

D. 1. Wheel rim cracked/broken.

D. 2. Wheel flange cracked/broken.

D. 3. Wheel plate cracked/broken.

D. 4 Wheel hub cracked/broken.

E. 1. Wheel has chip/gouge in flange 1½" in length and ½" or more in width.

E. 2. Wheel has chip/gouge in flange 1 5/8" in length and 5/8" or more in width.

E. 3. Wheel has chip/gouge in flange 1 3/4" in length and 3/4" or more in width.

F. 1. Wheel has flat/shelled spot 2 ½" or more in length.

F. 2. Wheel has two adjoining flat/shelled spots each of which is 2" long or longer.

F. 3. Wheel has a single flat or shelled spot 3" or more in length.

F. 4. Wheel has 2 adjoining flat/shelled spots, 1 at least 2" long; other

2 ½" or longer.

G. 1. Wheel is loose.

H. 1. Wheel overheated discoloration more than 4" on both sides of wheel.

H. 2. Wheel overheated discoloration more than 4 ½" on both sides of wheel.

I. 1. Wheel welded on car that is not moving for repairs.

Regulation

§ 215.105 Defective axle and journal

A railroad may not place or continue in service a car, if -
(a) An axle on the car has a crack or is broken;

(b) An axle on the car has a gouge in the surface that is -
(1) Between the wheel seats; and
(2) More than one-eighth inch in depth;

(c) An axle on the car, used in conjunction with a plain bearing, has an end collar that is broken or cracked;

(d) A journal on the car shows evidence of overheating, as evidenced by a pronounced blue black discoloration; or

(e) The surface of the plain bearing journal on the axle, or the fillet on the axle, has-
(1) A ridge;
(2) A depression;
(3) A circumferential score;
(4) Corrugation;
(5) A scratch;
(6) A continuous streak;
(7) Pitting;
(8) Rust; or
(9) Etching.

Interpretation

The specified axle measurements are the minimum safety requirements and are designed to prevent axle failures. Axle measurements must be carefully taken to ensure their accuracy.

An axle that is cracked or broken could cause a derailment.

An axle with a gouge more than 1/8 in. deep between the wheel seats could cause stress concentrations that may result in an axle failure.

A journal on a car that has been overheated could soon become a "hot box" and cause a derailment.

The surface of a plain bearing journal having any of the conditions stated in (e) (1) through (9) could result in a "hot box".

Defect Codes

Axle and Journal Conditions

215.105 A. 1. Axle cracked 1" or less.

A. 2. Axle cracked greater than 1".

A. 3. Axle broken or cracked with visible separation of metal.

B. 1. Axle with gouge between wheel seats more than 1/8" deep.

C. 1. Axle with broken or cracked end collar.

D. 1. Overheated journal.

E. 1. Plain bearing journal/fillet has a ridge.

E. 2. Plain bearing journal/fillet has a depression.

E. 3. Plain bearing journal/fillet has a circumferential score.

E. 4. Plain bearing journal/fillet has corrugation.

E. 5. Plain bearing journal/fillet has a scratch.

E. 6. Plain bearing journal/fillet has a continuous streak.

E. 7. Plain bearing journal/fillet is pitted.

E. 8. Plain bearing journal/fillet is rusted.

E. 9 Plain bearing journal/fillet has etching.

Regulation

§ 215.107 Defective plain bearing box: General.

A railroad may not place or continue in service a car, if the car has-

(a) A plain bearing box that does not contain visible free oil;

(b) A plain bearing box lid that is missing, broken, or open except to receive servicing; or

(c) A plain bearing box containing foreign matter, such as dirt, sand, or coal dust, that can be reasonably be expected to-
(1) Damage the bearing; or
(2) Have a detrimental effect on the lubrication of the journal and the bearings.

Interpretation

The requirement of a plain bearing box to contain visible free oil does not mean that the box must contain a measurable amount of oil._

A railroad may not continue in service a car with a plain bearing box lid that is missing, broken, or open except to receive servicing. This requirement is to prevent free entry of foreign matter that could damage the bearings and lead to a "hot box".

A plain bearing box that contains water should not be considered in itself as foreign matter.

A plain bearing box that does not contain adequate oil could result in a "hot box" and cause a derailment.

Plain bearing components must be in good condition at all times in an effort to minimize the potential of a hot box, burned off journal, etc. which may result in a serious derailment.

Defect Codes

Plain Bearing Lubrication

215.107

A. 1. One plain bearing box does not contain visible free oil.

A. 2. Two plain bearing boxes do not contain visible free oil.

A. 3. Three plain bearing boxes do not contain visible free oil.

A. 4. Four plain bearing boxes do not contain visible free oil.

A. 5. Five plain bearing boxes do not contain visible free oil.

A. 6. Six plain bearing boxes do not contain visible free oil.

A. 7. Seven plain bearing boxes do not contain visible free oil.

A. 8. Eight plain bearing boxes do not contain visible free oil.

A. 9. More than eight plain bearing boxes do not contain visible free oil.

B. 1. Plain bearing box lid is missing, broken or open except to receive service.

C. 1. Plain bearing box has foreign matter that will damage bearing or prevent lubrication.

D. 1. One plain bearing box with dry lubricating pad.

D. 2. Two plain bearing boxes with dry lubricating pads.

D. 3. Three plain bearing boxes with dry lubricating pads.

D. 4. Four plain bearing boxes with dry lubricating pads.

D. 5. Five plain bearing boxes with dry lubricating pads.

D. 6. Six plain bearing boxes with dry lubricating pads.

D. 7. Seven plain bearing boxes with dry lubricating pads.

D. 8. Eight plain bearing boxes with dry lubricating pads.

D. 9 More than eight plain bearing boxes with dry lubricating pads.

Regulation

§ 215.109 Defective plain bearing box: Journal lubricating system.

A railroad may not place or continue in service a car, if the car has a plain bearing box with a lubricating pad that-
(a) Has a tear extending half the length or width of the pad, or more;

(b) Shows evidence of having been scorched, burned, or glazed;

(c) Contains decaying or deteriorated fabric that impairs proper lubrication of the pad;

(d) Has-
(1) An exposed center core (except by design); or
(2) Metal parts contacting the journal; or

(e) Is-
(1) Missing; or
(2) Not in contact with the journal.

Interpretation

A plain bearing box lubricating system having any of the above conditions may not provide adequate lubrication and could cause a "hot box", resulting in a derailment.

Defect Codes

Lubricating Pads

215.109 A. 1. Plain bearing box lube pad torn half the length or width.

B. 1. Plain bearing box lube pad scorched, burned, or glazed.

C. 1. Plain bearing box lube pad with decaying/deteriorated fabric.

D. 1. Lube pad has exposed core/metal parts in contact with journal except by design.

E. 1. Plain bearing box lube pad missing.

E. 2. Plain bearing box lube pad not in contact with journal.

Regulation

§ 215.111 Defective Plain Bearing.

A railroad may not place in service or continue in service a car, if the car has a plain bearing-
(a) That is missing, cracked or broken;

(b) On which the bearing liner-
(1) Is loose; or
(2) Has a broken out piece; or

(c) That shows signs of having been overheated, as evidenced by-
(1) Melted babbitt;
(2) Smoke from hot oil; or
(3) Journal surface damage.

Federal Railroad Administration

Interpretation

A plain bearing having any of the above stated conditions may not provide adequate lubrication and result in a "hot box" and possible derailment.

Defect Codes

Plain Bearing

215.111 A. 1. Plain bearing missing, cracked or broken.

B. 1. Plain bearing with lining loose.

B. 2. Plain bearing with piece broken out.

C. 1. Plain bearing overheated as evidenced by babbitt melted.

C. 2. Plain bearing overheated as evidenced by smoke from hot oil.

C. 3. Plain bearing overheated as evidenced by journal surface damage.

Regulation

§ 215.113 Defective Plain Bearing Wedge.

A railroad may not place or continue in service a car, if a plain bearing wedge on that car is-

(a) Missing;

(b) Cracked;

(c) Broken; or

(d) Not located in its design position.

Interpretation

A plain bearing wedge having any of the above conditions may cause an uneven load distribution on the bearing resulting in bearing failure, which could lead to a "hot box" and or derailment.

Defect Codes

Plain bearing Wedges

215.113 A. 1. Plain bearing wedge missing.

B. 1. Plain bearing wedge cracked.

C. 1. Plain bearing wedge broken.

D. 1. Plain bearing wedge not located in designed position.

Interpretation

It is important that each plain bearing box component be in good condition to perform its designed function. Proper lubrication is of the greatest importance in preventing hot boxes which can result in causing derailments.

Regulation

§ 215.115 Defective Roller Bearing.

(a) A railroad may not place or continue in service a car, if the car has-
(1) A roller bearing that shows signs of having been overheated as evidenced by-
(i) Discoloration; or
(ii) Other telltale signs of overheating such as damage to the seal or distortion of any bearing component;
(2) A roller bearing with a-
(i) Loose or missing cap screw; or
(ii) Broken, missing, or improperly applied cap screw lock; or
(3) A roller bearing with a seal that is loose or damaged, or permits leakage of lubricant in clearly formed droplets.

(b)(1) A railroad may not continue in service a car that has a roller bearing whose truck was involved in a derailment unless the bearing has been inspected and tested by:
(i) Visual examination to determine whether it shows any sign of damage; and
(ii) Spinning freely its wheel set or manually rotating the bearing to determine

whether the bearing makes any unusual noise.
(2) The roller bearing shall be disassembled from the axle and inspected internally if-
(i) It shows any external sign of damage;
(ii) It makes any unusual noise when its wheel set is spun freely or the bearing is manually rotated;
(iii) Its truck was involved in a derailment at a speed of more than 10 miles per hour; or
(iv) Its truck was dragged on the ground for more than 200 feet.
(3) Each defective roller bearing shall be repaired or replaced before the car is placed back in service.

[44 FR 77340, Dec.31, 1979, as amended at 45 FR 26711, Apr. 21, 1980]

Interpretation

A loose, missing or improperly applied cap screw may lessen the torque of stack and cause the bearing to run "hot".

Some loss of lubricant through "seepage" of lubricant around a roller bearing seal may not be hazardous and should not be reported as a defect. A seal that is "loose, damaged, or non-functioning" is considered to be defective. Also, a seal that "permits leakage of lubricant in clearly formed droplets" is defective.

"Clearly formed droplets" is to mean a **fresh** accumulation of grease/oil (not dirty or dried) which continually and/or slowly forms into beads.

A careful examination should be made of roller bearings from which "fresh" or "new" lubricant is thrown on wheels or truck components.

When a railroad opts to rotate the roller bearing manually rather than rotating the wheel assembly to detect a defective condition, due to derailment, care must be exercised because the presence of lubricant and the fact that the bearing is not under load tend to reduce sounds made by small defects. When the wheel assembly is rotated, the weight on the bearing magnifies the sound.

Cap screw seal rings have been a part of the roller bearing assembly since the inception of NFL (No field lubrication) roller bearing on January 1, 1977. The cap screw seal ring was designed to improve the roller bearing's resistance to the intrusion of water. Tests indicated that installations requiring heavy cap screw seal ring compression exhibit a significant reduction in end cap deflection when compared to the same amount of applied

torque when cap screw seal rings are not used. Effective May 1, 1988 the AAR prohibited the application of cap screw seal rings (0 rings), due to clamping loss on stack, which reportedly caused bearing failures.

A "loose" backing ring is not to be reported as a defective bearing.

Defect Codes

Roller Bearing Conditions

215.115 A. 1. Roller bearing overheated.

A. 2. Roller bearing having loose or missing cap screw.

A. 3. Roller bearing seal loose/damaged permitting loss of lubricant.

A. 4. Roller bearing having two or more missing cap screws.

A. 5. Roller bearing cap screw lock improperly applied, broken or missing.

A. 6. Roller bearing having loose or missing cap screws with cap screw seal rings (0 rings).

B. 1. Roller bearing - failure to inspect if involved in derailment.

B. 2. Roller bearing - failure to disassemble if required due to derailment.
B. 3. Roller bearing - failure to repair/replace when defective due to derailment.

§ 215.117 Defective Roller Bearing Adapter

A railroad may not place or continue in service a car, if the car has a roller bearing adapter that is-
(a) Cracked or broken;
(b) Not in its design position; or
(c) Worn on the crown of the adapter to the extent that the frame bears on the relief portion of the adapter, as shown in the figure below (see figure 1).

Federal Railroad Administration

Interpretation

A car should be removed from service if it has a roller bearing adapter that is out of place or has excessive wear on the crown of the adapter. Either condition could cause uneven load distribution on the bearing and result in bearing failure. The top of the roller bearing adapter is crowned with a 60 degree radius to distribute the load on the bearing. When this "crown" is worn to the extent that the relief portion bears on the truck side frame could cause uneven load distribution on the bearing and thus result in bearing failure. Caution should be used in determining this condition as there may be clearance (relief) at rear of adapter bearing surface with truck side. Also, older adapters have raised letters in the relief portion. A 0.002 inch feeler gauge may be used to assist in making this determination.

*** TTUX cars are designed with a single axle wheel set at each end. The adapter blocks are located beneath the roller bearing and are secured in place by a single bolt or cotter key.**

* The adapter pad (vertical isolation pad) is primarily found on articulated 125 ton double stack cars. The pad is supposed to fit in the depression of the roller bearing adapter and act as the crown for proper contact with the truck side frame roof. A loss or failure of a pad or a pad not in its designed position will tend to concentrate the off center loading to the part of the pad that has not failed. This condition of concentrated off-center loading creates a potential roller bearing failure.

Inspectors should also be alert for the misapplied roller bearing adapters on this type of equipment.

Adapter wear plates should be examined as to there condition and effectiveness.

Defect Codes

Bearing Adapter

215.117 A. 1. Defective Roller bearing Adapter cracked or broken.

B. 1. Roller bearing adapter not in designed position.

C. 1. Roller bearing adapter worn excessively in relief portion.

D. 1. Roller bearing adapter block (single axle) out of its designed position, broken or missing.

E. 1. Roller bearing adapter resilient wear plate (vertical isolation pad) defective or not in its designed position.

§ 215.119 Defective Freight Car Truck.

A railroad may not place or continue in service a car, if the car has-
(a) A side frame or bolster that-
(1) Is broken; or
(2) Has a crack of 1/4 of an inch or more in the transverse direction on a tension member

(b) A truck equipped with a snubbing device that is ineffective, as evidenced by-
(1) A snubbing friction element that is worn beyond a wear indicator;
(2) A snubber wear plate that is loose, missing (except by design) or worn through;
(3) A broken or missing snubber activating spring; or
(4) Snubber unit that is broken, or in the case of hydraulic units, is leaking clearly formed droplets of oil or other fluid;

(c) A side bearing in any of the following conditions:
(1) Part of the side bearing assembly is missing or broken;
(2) The bearings at one end of the car have a total clearance from the body bolster of more than 3/4 of an inch; or
(3) The bearings at one end of the car, are in contact with the body bolster (except by design);
(4) At diagonal opposite sides of the car, the bearings have a total clearance from the body bolsters of more than 3/4 of an inch;

(d) Truck springs-
(1) That do not maintain travel or load;
(2) That are compressed solid; or
(3) More than one outer spring of which is broken, missing, in any spring cluster;

(e) Interference between the truck bolster and the center plate that prevents proper truck rotations; or

(f) Brake beam shelf support worn so excessively that it does not support the brake beam.

Federal Railroad Administration

Interpretation

Truck Side Frame or Bolster
Freight car trucks side frame or truck bolster "broken" means separated into parts.

A tension member must be cracked more than 1/4 in. in a transverse direction (right angle) before it can be considered defective.

Snubbing Devices
The terms snubbing units, attachments, and wear plates, where used collectively, have been consolidated into one term, snubbing device.

A car that has ineffective snubbing, or broken snubbing devices, will respond more violently to track irregularities and may cause a derailment. This would include the condition of a loose, missing or worn through snubber wear plate.

"Clearly formed droplets" is to mean a **fresh** accumulation of grease/oil (not dirty or dried) which continually and/or slowly forms into beads.

A leaking snubbing device is not considered defective if that leakage does not amount to clearly formed droplets.

Hydraulic snubbing devices regardless of presence of clearly formed droplets, equipped with a "sight gauge" or "inspection window" which visibly indicates the presence of oil or other fluid when in a normal vertical position will not be considered as defective.

Side Bearings
A missing or broken side bearing generates an uneven load distribution in the suspension system that could shift the lading. This in turn would cause the car to sway and derail.

A railroad may not continue in service a car having side bearings in any of the following conditions:

(1) Any part of a car truck side bearing assembly is missing or broken;

(2) The bearing at one end of the car, on both sides, is in contact with the body bolster (except by design);
This condition may prevent the truck from swiveling and remain skewed which may result in derailment.

(3) The bearing at one end of the car, has a total clearance from the body bolster of more...

than three-fourths inch; or (4) At diagonal two opposite side bearings of a car, when the car is placed on tangent and level track, the bearings have a total clearance from the body bolsters of more than three-fourths of an inch.

These conditions may cause the car body to sway or oscillate excessively and derail.

If a side bearing cage is cracked in a non stress area exception should not be taken.

Truck Springs

One broken outer truck spring in a cluster does not create enough of an uneven load distribution to remove the car from service. A car would have to be removed from service if it has more than one missing or broken outer truck springs within any cluster, or if the remaining truck springs are fully compressed.

The truck bolster being restricted in rotation may cause a derailment.

The brake beam shelf must be worn to the extent that they will not support the brake beam.

Defect Codes

Truck Conditions

215.119 A. 1. Freight car trucks side frame or bolster broken.

A. 2. Truck side frame/bolster cracked 1/4" or more in transverse direction on tension member.

A. 3. Truck side frame/bolster cracked 1" or more in transverse direction on tension member.

B. 1. Freight car trucks having ineffective snubbing devices.

B. 2. Freight car trucks having friction snubber wear plate loose, missing or worn through.

B. 3. Freight car trucks having ineffective hydraulic snubbing device.

C. 1. Freight car trucks having missing or broken side bearing.

C. 2. Freight car trucks side bearing in contact except by design.

C. 3. Freight car trucks excessive side bearing clearance at one end of car.

C. 4. Freight car trucks of a car placed on tangent and level track at diagonal opposite sides, the side bearings have a total clearance from the body bolsters of more than 3/4 of an inch.

D. 1. Truck springs that will not maintain travel or load.

D. 2. Truck springs that are compressed solid.

D. 3. Truck springs-two or more are broken in a cluster.

D. 4. Truck spring-three or more springs broken.

E. 1. Truck bolster and center plate interference preventing rotation.

F. 1. Brake beam shelf supports worn - shelf will not support beam.

Regulation

Car Bodies

§ 215.121 Defective Car Body

A railroad may not place or continue in service a car, if:
(a) Any portion of the car body truck, or their appurtenances (except wheels) has less than a 2½ inch clearance from the top of the rail;

(b) The car center sill is:
(1) Broken;
(2) Cracked more than 6 inches; or
(3) Permanently bent or buckled more than 2½ inches in any six foot length;

(c) The car has a coupler carrier that is:
(1) Broken;
(2) Missing;
(3) Non-resilient and the coupler has a type F head.

(d) After December 1, 1983, the car is a box car and its side doors are not equipped

with operative hangers, or the equivalent to prevent the doors from becoming disengaged.

(e) The car has a center plate:
(1) That is not properly secured;
(2) Any portion of which is missing; or
(3) That is broken; or
(4) That has two or more cracks through its cross section (thickness) at the edge of the plate that extend to the portion of the plate that is obstructed from view while the truck is in place; or

(f) The car has a broken sidesill, crossbearer, or body bolster.

[44 FR 77340, Dec. 31,1979, as amended at 47 FR 53737, Dec.29,1982]

Interpretation

The requirement of maintaining car body clearance of 2 1/2 in.is to ensure that car body items, including air hoses are prevented from dragging on a road crossing or track structure which may cause **a derailment.**

Center Sills

A center sill is generally the central longitudinal member of the under-frame of a car, which forms the backbone of the under-frame and transmits most of the buffing shocks, from one end of the car to the other.

A center sill "broken" means a fracture resulting in complete separation into parts. A condition of this nature could result in train separation or derailment.

A center sill that is cracked more than a total of 6 inches through the center sill or center sill cross sections immediately adjacent to each other is hazardous because it may undermine the integrity of the sill or propagate rapidly and thus result in a break. A broken center sill is hazardous and warrants removal of car from service. Both of these conditions create the danger of train separation.

A center sill bent or buckled more than 2 1/2 in. in any 6 - foot length may undermine the integrity of the sill and result in a center sill failure, which may create a dangerous condition, resulting in a train separation or derailment.

Similar, in "sliding sill" designs, a single hydraulic unit is installed at the center of the car and acts to control longitudinal forces received at either end of an auxiliary center sill, which is free to travel longitudinally within a fixed center sill.

This type of center sill should be inspected for defects such as, cracks more than 6 inches, bent or buckled more than 2 1/2 in. in any 6-foot length or broken.

Coupler Carrier

A coupler carrier that is broken or missing could allow the coupler to drop, resulting in a train parting which may cause a derailment.

The design of an "F" type coupler head requires a flexible coupler carrier.

Center Plate

A car with a loose, cracked or broken body center plate that is continued in service may result in the truck becoming disengaged from the body and cause a serious accident.

Broken Side Sill, Crossbearer

A broken side sill or crossbearer is indicative of a serious problem which should be corrected before it deteriorates to where the car body bears on the track.

Broken body bolster

A car should be taken out of service if the bolster is broken so badly that there is no side bearing clearance or the bolster is broken down to the point where the side sill is riding on top of the truck side frame. A broken body bolster is prohibited.

Door safety hangers

FRA considers door safety hangers to be one of the most critical safety requirements, a number of personal injuries and fatalities have occurred which involved plug doors falling off box cars. Door safety hangers must be capable of restraining the side door when the side door in an open position and the bottom rollers of the door are off the door track.

Defect Codes

Car Body Conditions

215.121

A. 1. Car body clearance improper - less than 2½ " from top of rail.

B. 1. Fixed Center sill is broken.

B. 2. Fixed Center sill is cracked more than 6".

B. 3. Fixed Center sill bent or buckled more than 2½ " in. any 6-foot length.

B. 4. Sliding sill of cushion under-frame car is broken.

B. 5. Sliding center sill is cracked more than 6".

B. 6. Sliding center sill is bent or buckled more than 2½ " in any 6-foot length.

B. 7. One of two longitudinal outboard sills which is located along each side of car and is designed and constructed to transmit longitudinal train forces is broken.

B. 8. One of two longitudinal outboard sills which is located along each side of car and is designed and constructed to transmit longitudinal train forces is cracked more than 6 ".

B. 9. One of two longitudinal outboard sills which is located along each side of car and is designed and constructed to transmit longitudinal train forces is bent or buckled more than 2½ " in any 6-foot length.

C. 1. Coupler carrier broken.

C. 2. Coupler carrier missing.

C. 3. Coupler carrier non-resilient when used with coupler with F head.

D. 1. Car door not equipped with operative safety hangers.

E. 1. Car body center plate not properly secured.

E. 2. Car body center plate any portion missing.

E. 3. Car body center plate broken or cracked as defined in this part.

E. 4. Car body center plate with two or more cracks through cross section of visible portion.

F. 1. Car body side sills, crossbars, or body bolster broken.

Regulation

Draft System

§ 215.123 Defective Couplers

A railroad may not place or continue in service a car, if-
(a) The car is equipped with a coupler shank that is bent out of alignment to the extent that the coupler will not couple automatically with the adjacent car;

(b) The car has a coupler that has a crack in the highly stressed junction area of the shank and head as shown in the figure below (see figure 2).

(c) The car has a coupler knuckle that is broken or cracked on the inside pulling face of the knuckle.

(d) The car has a knuckle pin or knuckle thrower that is:
(1) Missing; or
(2) Inoperative; or

(e) The coupler has a retainer pin lock that is-
(1) Missing; or
(2) Broken; or

(f) The car has a coupler with any of the following conditions:
(1) The locklift is inoperative;
(2) The coupler assembly does not have anti-creep protection to prevent unintentional unlocking of the coupler lock; or
(3) The coupler lock is-
(i) Missing;
(ii) Inoperative;
(iii)Bent;
(iv) Cracked; or

(v) Broken.

Interpretation

Couplers

Bent coupler shank - A coupler shank is considered to be bent if the coupler will not couple automatically with the adjacent car.

Cracked coupler - Be certain the crack is in the highly stressed area as shown in figure 2. The definition of a crack or break must be applied and used judiciously when examining a coupler for such a noncomplying condition. If the condition observed is a shrinkage crack or a hot tear that does not significantly diminish the strength of the coupler, it is not to be considered to be a crack.

The regulation is specific in that the coupler knuckle must be broken or cracked on the inside pulling face of the knuckle.

A coupler knuckle pin or knuckle thrower missing or inoperative may create a potential personal injury hazard.

Coupler retainer pin lock broken or missing - This condition may result in the loss of the coupler retainer and cause a train parting or derailment.

An articulated car is created by joining two or more units to form a single unit connected by a drawbar or coupling between the units. Many articulated cars share a common truck under the articulated joints.

Coupler locklift inoperative this condition would prevent the automatic coupler from functioning as intended.

The anti-creep protection should be capable of preventing the unintentional unlocking of the coupler lock. This condition could cause train parting resulting in an undesired emergency air brake application. A coupler lock lift slightly raised may raise the coupler lock and nullify the anti-creep protection of the coupler.

An excessively worn coupler lock may render the anti-creep feature built into both "E" and "F" type couplers ineffective.

A coupler lock missing, inoperative or bent may require workmen to cross between cars

to uncouple them, creating a hazardous condition.

A coupler lock that is cracked or broken may require workmen to cross between cars to uncouple them, creating a hazardous condition.

Defect Codes

Coupler Conditions

215.123

A. 1. Coupler shank bent.

B. 1. Coupler cracked in highly stressed area of head and shank.

C. 1. Coupler knuckle broken.

C. 2. Coupler knuckle cracked on inside pulling face of knuckle.

D. 1. Coupler pin/knuckle thrower missing.

D. 2. Coupler pin/knuckle thrower inoperative.

D. 3. Articulated car; coupler pin missing.

D. 4. Articulated car; coupler pin inoperative.

E. 1. Coupler retainer pin lock missing.

E. 2. Coupler retainer pin lock broken.

E. 3. Articulated car; retainer pin lock missing.

E. 4. Articulated car; retainer pin lock broken.

F. 1. Coupler locklift inoperative.

F. 2. Coupler with no anti-creep protection.

F. 3. Coupler lock missing.

F. 4. Coupler lock inoperative.

F. 5. Coupler lock bent.

F. 6. Coupler lock cracked.

F. 7. Coupler lock broken.

Regulation

§ 215.125 Defective Uncoupling Device.

A railroad may not place or continue in service a car, if the car has an uncoupling device without sufficient vertical and lateral clearance to prevent-
(a) Fouling on curves; or

(b) Unintentional uncoupling.

Interpretation

The uncoupling device must have vertical and lateral clearance and be in a proper condition to prevent fouling on a curve or unintentional uncoupling.

Defect Codes

Uncoupling Levers

215.125 A. 1. Uncoupling device fouling on curve.

B. 1. Uncoupling device unintentional uncoupling.

Regulation

§ 215.127 Defective Draft Arrangement.

A railroad may not place or continue in service a car, if-
(a) The car has a draft gear that is inoperative;

(b) The car has a broken yoke;

(c) An end of car cushioning unit is-
(1) Leaking clearly formed droplets; or

(2) Inoperative;

(d) A vertical coupler pin retainer plate-
(1) Is missing (except by design); or
(2) Has a missing fastener;

(e) The car has a draft key, or draft key retainer, that is-
(1) Inoperative; or
(2) Missing; or

(f) The car has a missing or broken follower plate.

Interpretation

A determination must be made that the draft gear unit is **not** performing its intended function of absorbing shocks and impact forces.

A broken coupler yoke could cause the draft system to fail and result in a train separation and/or derailment.

An end of car cushioning unit is defective if it is inoperative and not performing its intended function of absorbing shocks or impacts or is leaking clearly formed droplets. Either of these conditions could lead to violent slack action in trains that could cause personal injury or derailment.

An end of car cushioning unit should not be considered defective if it is losing only a minute amount of fluid through "seepage". The primary concern is an excessive loss of fluid that could render the cushioning unit inoperative. This condition can lead to violent slack action in trains and cause serious injuries and derailments. A leaking cushioning unit is defective if it is leaking fluid in clearly formed droplets. Remember, "clearly formed droplets means a fresh accumulation of oil (not dirty or dried) which continually and/or slowly forms into beads.

A missing or defective vertical coupler pin retainer, draft key or draft key retainer or a follower block could cause a train parting and/or derailment.

An articulated joint is the coupling between two or more units by means of a drawbar or similar coupling.

Defect Codes

Draft Conditions

215.127 A. 1. Draft gear inoperative.

B. 1. Coupler yoke broken.

C. 1. End of car cushioning unit leaking.

C. 2. End of car cushioning unit inoperative.

D. 1. Vertical coupler pin retainer plate missing.

D. 2. Vertical coupler pin retainer fastener missing.

E. 1. Draft key or draft key retainer inoperative.

E. 2. Draft key or draft key retainer missing.

F. 1. Follower plate missing or broken.

G. 1. Articulated joint broken.

G. 2. Articulated joint cracked 50 % or more, through cross section area.

Regulation

§ 215.129 Defective cushioning device.

A railroad may not place or continue in service a car if it has a cushioning device that is-
(a) Broken;

(b) Inoperative; or

(c) Missing a part-
unless its sliding components have been effectively immobilized.

Interpretation

A cushioning unit should not be considered defective if it is losing only a minute amount

of fluid through "seepage". The primary concern is an excessive loss of fluid that could render the cushioning unit inoperative. This condition can lead to violent slack action in trains and cause serious injuries and derailments. A leaking cushioning unit is defective if it is leaking fluid in clearly formed droplets. Remember, "clearly formed droplets means a **fresh** accumulation of oil (not dirty or dried) which continually and/or slowly forms into beads.

A car with an effectively immobilized cushioning unit can be moved for repair in accordance with the provisions of § 215.9.

A car with an effectively immobilized sliding sill is permitted to move for repair, under § 215.9.

A car with a defective sliding sill, can be moved for repair only after a qualified person determines whether it can be safely moved, establishes the restrictions to ensure safe movement, and complies with other requirements as prescribed in § 215.9.

Defect Codes

215.129 A. 1. Cushioning device broken and not effectively immobilized.

B. 1. Cushioning device inoperative and not effectively immobilized.

C. 1. Cushioning device missing parts and not effectively immobilized.

Regulation

Subpart C-Restricted Equipment

§ 215.201 Scope.

This subpart contains requirements restricting the use of certain railroad freight cars.

§ 215.203 Restricted cars.

(a) This section restricts the operation of any railroad freight car that is-
(1) More than 50 years old, measured from the date of original construction;
(2) Equipped with any design or type component listed in appendix A to this part; or

(3) Equipped with a Duryea under-frame constructed before April 1, 1950, except for a caboose which is operated as the last car in a train.

(b) A railroad may not place or continue in service a railroad freight car described in paragraph (a) of this section, except under conditions approved by the Federal Railroad Administrator.

(c) A railroad may petition the Administrator to continue in service a car described in paragraph (a) of this section. Each petition shall be:
(1) submitted not less than 90 days before the car is to be operated;
(2) Be submitted in triplicate; and
(3) State or describe the following:
(i) The name and principal business address of the petitioning railroad.
(ii) The name and address of the entity that controls the operation and maintenance of the car involved.
(iii) The number, type, capacity, reporting marks, and car numbers of the cars, their condition, status and age measured from the date of original construction.
(iv) The design, type component, or other item that causes the car to be restricted.
(v) The maximum load the cars would carry.
(vi) The maximum speed at which the cars would be operated.
(vii) That each car has been examined and found to be safe to operate under the conditions set forth in the petition.
(vii) The territorial limits within which the cars are to be operated and the name of each railroad that will receive the cars in interchange.

Interpretation

Primarily, exception is taken to the operation of 50 year old cars and/or with restricted components. Additionally, restricted cars have been found to have been operating in other than approved territorial limits.

Defect Code

215.203 A. 1. Operating restricted car. Except under FRA approved condition

Subpart D-Stenciling

§ 215.301 General

The railroad or private car owner reporting mark, the car number, and built date shall be stenciled, or otherwise displayed, in clearly legible letters and numbers not less than seven inches high, except those of the built date which shall not be less than one inch high:
(a) On each side of each railroad freight car body; and

(b) In the case of a tank car, in any location that is visible to a person walking at track level beside the car.

§ 215.303 Stenciling of restricted cars.

(a) Each restricted railroad freight car that is described in § 215.205(a) of this part shall be stenciled, or marked-
(1) In clearly legible letters; and
(2) In accordance with paragraphs (b) and (c) of this section.

(b) The letter "R" shall be-
(1) Placed immediately below or to the right of the car number;
(2) The same color as the reporting mark; and
(3) The same size as the reporting mark.

(c) The following terms, to the extent needed to completely indicate the basis for the restricted operation of the car, shall be placed on the car following the symbol "R" in letters not less than one inch high:
(1) Age
(2) Coupler.
(3) Draft.
(4) Bearings.
(5) Truck.
(6) Under-frame.
(7) Wheels.
(8) Yoke.

§ 215.305 Stenciling of maintenance-of-way equipment.

(a) Maintenance-of-way equipment (including self-propelled maintenance-of-way equipment) described in § 215.3(c)(3) shall be stenciled, or marked-
(1) In clearly legible letters; and
(2) In accordance with paragraph (b) of this section.

(b) The letters "MW" must be-
(1) At least 2 inches high; and
(2) Placed on each side of the car.

[44 FR 77340, Dec. 31, 1979, as amended at 45 FR 26711, Apr. 21, 1980]

Interpretation

"MW' equipment is a piece of equipment owned/operated for railroad purposes.

Defect Codes

Restrictions and Stenciling

215.301	A. 1. Failure to stencil car number and date built on freight car as required (one or both sides).
215.303	A. 1. Failure to stencil restricted car as required.
215.305	A. 1. Failure to stencil maintenance-of-way equipment as required.

Federal Railroad Administration

Appendix D to Part 215 - Predeparture Inspection Procedure

At each location where a freight car is placed in a train and a person designated under § 215.11 is not on duty for the purpose of inspecting freight cars, the freight car shall, as a minimum, be inspected for the imminently hazardous conditions listed below that are likely to cause an accident or casualty before the train arrives at its destination. These conditions are readily discoverable by a train crew member in the course of a customary inspection.

1. **Car body**
   - (a) **Leaning or listing to side.**
   - (b) **Sagging downward.**
   - (c) **Positioned improperly on truck.**
   - (d) **Object dragging below.**
   - (e) **Object extending from side.**
   - (f) **Door insecurely attached.**
   - (g) **Broken or missing safety appliance.**
   - (h) **Lading leaking from a placarded hazardous material car.**
2. **Insecure coupling.**
3. **Overheated wheel or journal.**
4. **Broken or extensively cracked wheel.**
5. **Brake that fails to release.**
6. **Any other apparent safety hazard likely to cause an accident or casualty before the train arrives at its destination.**

[45 FR 26711, April 21, 1980]

Summary of Defect Codes

215.009 A. 1. Failure to meet conditions for movement of defective cars for repairs.

A. 2. Failure to prescribe appropriate requirements for movement of non-complying cars.

B. 1. Records inspected for movement of defective cars, (number).

C. 1. Improper or No Record for movement of defective cars for repairs.

D. 1. Records Inspection for repairs made to defective cars.

215.011 A. 1. Railroad fails to designate qualified persons to inspect freight cars.

A. 2. Persons designated don't have knowledge/ability to inspect cars for compliance with requirement.

B. 1. Railroad fails to maintain written record of each designation in effect.

B. 2. Railroad fails to maintain written record of the basis for this designation.

Inspection

215.013 A.1. Failure to perform pre-departure inspection.

A.2. Failure to perform Appendix D pre-departure inspection.

Wheel Conditions

215.103 A. 1. Wheel flange thickness 7/8" or less at 3/8" above the tread.

A. 2. Wheel flange thickness 13/16" or less at 3/8" above the tread.

A. 3. Wheel flange thickness 3/4" or less at 3/8" above the tread.

B. 1. Wheel flange is 1½" or more from the tread to top of flange.

B. 2. Wheel flange is 1 5/8" or more from the tread to top of flange.

B. 3. Wheel flange is 1-3/4" or more from the tread to top of flange.

C. 1. Wheel rim thickness is 11/16" or less.

C. 2. Wheel rim thickness is 5/8" or less.

C. 3. Wheel rim thickness is 9/16" or less.

D. 1. Wheel rim cracked/broken.

D. 2. Wheel flange cracked/broken.

D. 3. Wheel plate cracked/broken.

D. 4 Wheel hub cracked/broken.

E. 1. Wheel has chip/gouge in flange 1½" in length and ½" or more in width.

E. 2. Wheel has chip/gouge in flange 1 5/8" in length and 5/8" or more in width.

E. 3. Wheel has chip/gouge in flange 1 3/4" in length and 3/4" or more in width.

F. 1. Wheel has flat/shelled spot 2 ½" or more in length.

F. 2. Wheel has two adjoining flat/shelled spots each of which is 2" long or longer.

F. 3. Wheel has a single flat or shelled spot 3" or more in length.

F. 4. Wheel has 2 adjoining flat/shelled spots, 1 at least 2" long; other 2 ½" or longer.

G. 1. Wheel is loose.

H. 1. Wheel overheated discoloration more than 4" on both sides of

wheel.

H. 2. Wheel overheated discoloration more than 4 ½" on both sides of wheel.

I. 1. Wheel welded on car that is not moving for repairs.

Axle and Journal Conditions

215.105 A. 1. Axle cracked 1" or less.

A. 2. Axle cracked greater than 1".

A. 3. Axle broken or cracked with visible separation of metal.

B. 1. Axle with gouge between wheel seats more than 1/8" deep.

C. 1. Axle with broken or cracked end collar.

D. 1. Overheated journal.

E. 1. Plain bearing journal/fillet has a ridge.

E. 2. Plain bearing journal/fillet has a depression.

E. 3. Plain bearing journal/fillet has a circumferential score.

E. 4. Plain bearing journal/fillet has corrugation.

E. 5. Plain bearing journal/fillet has a scratch.

E. 6. Plain bearing journal/fillet has a continuous streak.

E. 7. Plain bearing journal/fillet is pitted.

E. 8. Plain bearing journal/fillet is rusted.

E. 9 Plain bearing journal/fillet has etching.

Plain Bearing Lubrication

215.107 A. 1. One plain bearing box does not contain visible free oil.

A. 2. Two plain bearing boxes do not contain visible free oil.

A. 3. Three plain bearing boxes do not contain visible free oil.

A. 4. Four plain bearing boxes do not contain visible free oil.

A. 5. Five plain bearing boxes do not contain visible free oil.

A. 6. Six plain bearing boxes do not contain visible free oil.

A. 7. Seven plain bearing boxes do not contain visible free oil.

A. 8. Eight plain bearing boxes do not contain visible free oil.

A. 9. More than eight plain bearing boxes do not contain visible free oil.

B. 1. Plain bearing box lid is missing, broken or open except to receive service.

C. 1. Plain bearing box has foreign matter that will damage bearing or prevent lubrication.

D. 1. One plain bearing box with dry lubricating pad.

D. 2. Two plain bearing boxes with dry lubricating pads.

D. 3. Three plain bearing boxes with dry lubricating pads.

D. 4. Four plain bearing boxes with dry lubricating pads.

D. 5. Five plain bearing boxes with dry lubricating pads.

D. 6. Six plain bearing boxes with dry lubricating pads.

D. 7. Seven plain bearing boxes with dry lubricating pads.

D. 8. Eight plain bearing boxes with dry lubricating pads.

D. 9 More than eight plain bearing boxes with dry lubricating pads.

Lubricating Pads

215.109 A. 1. Plain bearing box lube pad torn half the length or width.

B. 1. Plain bearing box lube pad scorched, burned, or glazed.

C. 1. Plain bearing box lube pad with decaying/deteriorated fabric.

D. 1. Lube pad has exposed core/metal parts in contact with journal except by design.

E. 1. Plain bearing box lube pad missing.

E. 2. Plain bearing box lube pad not in contact with journal.

Plain Bearing

215.111 A. 1. Plain bearing missing, cracked or broken.

B. 1. Plain bearing with lining loose.

B. 2. Plain bearing with piece broken out.

C. 1. Plain bearing overheated as evidenced by babbitt melted.

C. 2. Plain bearing overheated as evidenced by smoke from hot oil.

C. 3. Plain bearing overheated as evidenced by journal surface damage.

Plain bearing Wedges

215.113 A. 1. Plain bearing wedge missing.

B. 1. Plain bearing wedge cracked.

C. 1. Plain bearing wedge broken.

D. 1. Plain bearing wedge not located in designed position.

Roller Bearing Conditions

215.115 A. 1. Roller bearing overheated.

A. 2. Roller bearing having loose or missing cap screw.

A. 3. Roller bearing seal loose/damaged permitting loss of lubricant.

A. 4. Roller bearing having two or more missing cap screws.

A. 5. Roller bearing cap screw lock improperly applied, broken or missing.

A. 6. Roller bearing having loose or missing cap screws with cap screw seal rings (0 rings).

B. 1. Roller bearing - failure to inspect if involved in derailment.

B. 2. Roller bearing - failure to disassemble if required due to derailment.

B. 3. Roller bearing - failure to repair/replace when defective due to derailment.

Bearing Adapter

215.117 A. 1. Defective Roller bearing Adapter cracked or broken.

B. 1. Roller bearing adapter not in designed position.

C. 1. Roller bearing adapter worn excessively in relief portion.

D. 1. Roller bearing adapter block (single axle) out of its designed position, broken or missing.

E. 1. Roller bearing adapter resilient wear plate (vertical isolation pad) defective or not in its designed position.

Truck Conditions

215.119 A. 1. Freight car trucks side frame or bolster broken.

A. 2. Truck side frame/bolster cracked 1/4" or more in transverse direction on tension member.

A. 3. Truck side frame/bolster cracked 1" or more in transverse direction

on tension member.

B. 1. Freight car trucks having ineffective snubbing devices.

B. 2. Freight car trucks having friction snubber wear plate loose, missing or worn through.

B. 3. Freight car trucks having ineffective hydraulic snubbing device.

C. 1. Freight car trucks having missing or broken side bearing.

C. 2. Freight car trucks side bearing in contact except by design.

C. 3. Freight car trucks excessive side bearing clearance at one end of car.

C. 4. Freight car trucks of a car placed on tangent and level track at diagonal opposite sides, the side bearings have a total clearance from the body bolsters of more than 3/4 of an inch.

D. 1. Truck springs that will not maintain travel or load.

D. 2. Truck springs that are compressed solid.

D. 3. Truck springs-two or more are broken in a cluster.

D. 4. Truck spring-three or more springs broken.

E. 1. Truck bolster and center plate interference preventing rotation.

F. 1. Brake beam shelf supports worn - shelf will not support beam.

Car Body Conditions

215.121 A. 1. Car body clearance improper - less than 2½ " from top of rail.

B. 1. Fixed Center sill is broken.

B. 2. Fixed Center sill is cracked more than 6".

B. 3. Fixed Center sill bent or buckled more than 2½ " in. any 6-foot length.

B. 4. Sliding sill of cushion under-frame car is broken.

B. 5. Sliding center sill is cracked more than 6".

B. 6. Sliding center sill is bent or buckled more than 2½ " in any 6-foot length.

B. 7. One of two longitudinal outboard sills which is located along each side of car and is designed and constructed to transmit longitudinal train forces is Broken.

B. 8. One of two longitudinal outboard sills which is located along each side of car and is designed and constructed to transmit longitudinal train forces is Cracked more than 6 ".

B. 9. One of two longitudinal outboard sills which is located along each side of car and is designed and constructed to transmit longitudinal train forces is bent or buckled more than 2½ " in any 6-foot length.

C. 1. Coupler carrier broken.

C. 2. Coupler carrier missing.

C. 3. Coupler carrier non-resilient when used with coupler with F head.

D. 1. Car door not equipped with operative safety hangers.

E. 1. Car body center plate not properly secured.

E. 2. Car body center plate any portion missing.

E. 3. Car body center plate broken or cracked as defined in this part.

E. 4. Car body center plate with two or more cracks through cross section of visible portion.

F. 1. Car body side sills, crossbars, or body bolster broken.

Coupler Conditions

215.123 A. 1. Coupler shank bent.

B. 1. Coupler cracked in highly stressed area of head and shank.

C. 1. Coupler knuckle broken.

C. 2. Coupler knuckle cracked on inside pulling face of knuckle.

D. 1. Coupler pin/knuckle thrower missing.

D. 2. Coupler pin/knuckle thrower inoperative.

D. 3. Articulated car; coupler pin missing.

D. 4. Articulated car; coupler pin inoperative.

E. 1. Coupler retainer pin lock missing.

E. 2. Coupler retainer pin lock broken.

E. 3. Articulated car; retainer pin lock missing.

E. 4. Articulated car; retainer pin lock broken.

F. 1. Coupler locklift inoperative.

F. 2. Coupler with no anti-creep protection.

F. 3. Coupler lock missing.

F. 4. Coupler lock inoperative.

F. 5. Coupler lock bent.

F. 6. Coupler lock cracked.

F. 7. Coupler lock broken.

Uncoupling Levers

215.125 A. 1. Uncoupling device fouling on curve.

B. 1. Uncoupling device unintentional uncoupling.

Draft Conditions

215.127	A. 1. Draft gear inoperative.
	B. 1. Coupler yoke broken.
	C. 1. End of car cushioning unit leaking.
	C. 2. End of car cushioning unit inoperative.
	D. 1. Vertical coupler pin retainer plate missing.
	D. 2. Vertical coupler pin retainer fastener missing.
	E. 1. Draft key or draft key retainer inoperative.
	E. 2. Draft key or draft key retainer missing.
	F. 1. Follower plate missing or broken.
	G. 1. Articulated joint broken.
	G. 2. Articulated joint cracked 50 % or more, through cross section area.
215.129	A. 1. Cushioning device broken and not effectively immobilized.
	B. 1. Cushioning device inoperative and not effectively immobilized.
	C. 1. Cushioning device missing parts and not effectively immobilized.

Restrictions and Stenciling

215.203	A. 1. Operating restricted car. Except under FRA approved conditions.
215.301	A. 1. Failure to stencil car number and date built on freight car as required (one or both sides).
215.303	A. 1. Failure to stencil restricted car as required.
215.305	A. 1. Failure to stencil maintenance-of-way equipment as required.

Chapter 7

Blue Signal Protection of Workmen

Introduction

The minimum requirements for **Blue Signal Protection of Workmen** are prescribed in 49 CFR Part 218, Subpart B. This Subpart requires railroads take certain measures to protect their employees when engaged in inspection, testing, repair, and servicing of rolling equipment. It is designed to reduce the number of serious accidents resulting from human factors. A railroad may prescribe additional and/or more stringent requirements than those found in this regulation.

On the following pages you will find the regulation and any related information needed to perform blue signal inspections. The actual regulation will be indented and in bold type. After each section of the regulation is an interpretation as prepared by the staff of the Office of Safety. Following the interpretation is a procedure that can be followed that will allow you to conduct an effective blue signal inspection. Finally, the reporting codes you will use for reporting the results of your inspection are listed.

Reports of blue signal inspections are to be made on the Motive Power and Equipment Inspection Report, F 6180.59. It is not necessary to make a separate report for blue signal inspections except when reporting observations to determine compliance with § 218.30 - Remotely controlled switches (see section on remotely controlled switches).

On some occasions, it may be necessary to devote a major portion of the inspection day to conducting blue signal observations; however, in most instances, Inspectors should incorporate blue signal inspections with their routine inspection activities. For example, during a locomotive inspection at a locomotive repair facility, observations of that facility's blue signal protection would be appropriate.

Before conducting any blue signal inspections, it will be necessary to familiarize yourself with the regulation. Also, you will need knowledge of any permissible alternative methods of providing the required protection. For instance, using the above example, it is the railroad's option whether to use the procedures listed in 218.27 or 218.29 to protect a locomotive servicing track area. And finally, before entering a particular location, be aware of any waivers of this Subpart which are in effect there.

Remember, it is the railroad's obligation to provide blue signal protection. Your responsibility is to monitor if this has been done. If not, then you must take corrective action with the railroad to correct the situation.

Federal Railroad Administration

The blue signal information contained here was accurate when this manual was compiled. It is the Inspector's responsibility to update this information whenever changes in the regulation or policy are made.

Regulation

PART 218 - Railroad Operating Practices

Subpart A - General

Sec.

Subpart B - Blue Signal Protection of Workmen

Subpart A - General

§ 218.1 Purpose.

This part describes minimum requirements for railroad operating rules and practices. Each railroad may prescribe additional or more stringent requirements in its operating rules, timetables, timetable special instructions, and other special instructions.

§ 218.3 Application.

(a) Except as provided in paragraph (b) of this section, this part applies to railroads that operate rolling equipment on standard gage track which is part of the general railroad system of transportation.

(b) This part does not apply to-
(1) A railroad that operates only on track inside an installation which is not part of the general railroad system of transportation, or
(2) Rapid transit operations in an urban area that are not connected with the general railroad system of transportation.

[44 FR 2175, Jan. 10, 1979, as amended at 53 FR 28599, July 28, 1988]

Interpretation

This part applies to railroads that operate rolling equipment on standard gage track which is part of the general railroad system of transportation. It does not apply to a railroad that operates only on track inside an installation which is not part of the general railroad system of transportation or a railroad that operates only on track used exclusively for rapid transit, commuter, or other short haul passenger service in a metropolitan or suburban area. At a minimum, a railroad that participates in interchange with another railroad is considered to be part of the general railroad system of transportation for purposes of this part.

Regulation

§ 218.5 Definitions.

As used in this part-

(a) ***Workman*** **means railroad employees assigned to inspect, test, repair, or service railroad rolling equipment, or their components including brake systems. Train and yard crews are excluded except when assigned to perform such work on railroad rolling equipment that is not part of the train or yard movement they have been called to operate.**

> **Note:** ***Servicing*** **does not include supplying cabooses, locomotives, or passenger cars with items such as ice, drinking water, tools, sanitary supplies, stationery, or flagging equipment.**
>
> ***Testing*** **does not include**
> **(i) visual observations made by an employee positioned on or alongside a caboose, locomotive, or passenger car; or**
> **(ii) marker inspections made in accordance with the provisions of § 221.16(b) of this chapter.**

(b) ***Rolling equipment*** **includes locomotives, railroad cars, and one or more**

locomotives coupled to one or more cars.

(c) *Blue signal* means a clearly distinguishable blue flag or light by day and a blue light at night. When attached to the operating controls of a locomotive, it need not be lighted if the inside of the cab area of the locomotive is sufficiently lighted so as to make the blue signal clearly distinguishable.

(d) *Effective locking device* when used in relation to a manually operated switch or a derail means one which is :
(1) Vandal resistant;
(2) tamper resistant; and
(3) capable of being locked and unlocked only by the class, craft or group of employees for whom the protection is being provided.

(e) *Car shop repair track area* means one or more tracks within an area in which the testing, servicing, repair, inspection, or rebuilding of railroad rolling equipment is under the exclusive control of mechanical department personnel.

(f) *Locomotive servicing track area* means one or more tracks, within an area in which the testing, servicing, repair, inspection, or rebuilding of locomotives is under the exclusive control of mechanical department personnel.

(g) *Main track* means a track, other than an auxiliary track, extending through yards or between stations, upon which trains are operated by timetable or train order or both, or the use of which is governed by a signal system.

(h) *Locomotive* means a self-propelled unit of equipment designed for moving other equipment in revenue service including a self-propelled unit designed to carry freight or passenger traffic, or both, and may consist of one or more units operated from a single control.

(i) *Switch providing access* means a switch which if traversed by rolling equipment could permit that rolling equipment to couple to the equipment being protected.

(j) *Group of workmen* means two or more workmen of the same or different crafts assigned to work together as a unit under a common authority and who are in communication with each other while the work is being done.

(k) *Interlocking limits* means the tracks between the opposing home signals of an interlocking.

(l) *Flagman's signals* means a red flag by day and a white light at night, and a

specified number of torpedoes and fusees as prescribed in the railroads operating rules.

(m) *Absolute block* means a block in which no train is permitted to enter while it is occupied by another train.

(n) *Camp car* means any on-track vehicle, including outfit, camp, or bunk cars or modular homes mounted on flat cars used to house rail employees. It does not include wreck trains.

Interpretation

Workman

In defining *Workman*, FRA sought to forestall the transfer of work, referred to in the regulation, to trainmen for the purpose of evading requirements of the regulation. Train and yard crew members are excluded from the requirements of this regulation when performing work traditionally performed by carmen, if such work is performed on rolling equipment they are called to operate. This exclusion is based on the rationale that, as an assigned crew member, they would have control over the movement of any rolling equipment on which they are working.

A *workman* is not excluded from the blue signal requirements simply because his name appears on a trainman roster. The nature of the work performed is the determining factor.

Railroad security forces or clerical personnel who board railroad cars for the purpose of checking lading for pilferage or vandalism, or store house employees loading or unloading cars are not considered to be *workmen* as defined in this part because they are not assigned to inspect, test, repair or, service the railroad rolling equipment. Therefore, blue signal protection is not required under the regulation. The same is true for non-railroad employees who load, unload, or secure loads.

Blue Signal

A *blue signal* used at night must be illuminated unless the cab of the locomotive is adequately lighted and the device is attached to the locomotive controls. A blue light with a weak battery or broken lens or a *blue signal* which is obviously inadequate in size and cannot be clearly distinguishable, would not be in compliance with the requirements of the regulation. A badly deteriorated blue sign or one which is covered with oil could not be considered to be in compliance. The effectiveness of the *blue signal* is dependent

upon the device being clearly distinguishable to the operator in control of the movement of rolling equipment; therefore, compliance must be evaluated with this in mind.

Effective locking device

The *locking device* must be of substantial construction which can be locked and unlocked only by the class, craft, or group of workmen performing work on the rolling equipment. A rail clamp or switch point blocking device which can not be locked does not comply with the requirements of the regulation. Train and yard crews should not be able to unlock switches or derails protecting *workmen*.

When train or yard crews need to use a switch lock for the purposes of this regulation, **the switch lock used should be other than the standard switch lock**, and visible blue signals must be displayed at or near the locked switch or derail.

Car shop repair track area

This includes heavy repair tracks located within buildings as well as tracks where total erecting or rebuilding of rolling equipment occurs.

Locomotive servicing track area

This includes tracks known as "back-shops" and tracks within the area which are located inside of buildings where major overhauling of rebuilding of locomotives occurs.

Main track

The definition of *main track* has been used in railroad operating rule books for many years and should have a common meaning throughout the industry to the extent that there should be no mistaking it from tracks commonly known by other defined terms, such as "yard tracks" or "siding" in judging compliance with this regulation. The fact that the authority for movement on a track is Rule 93, "Yard limits", has no bearing on this interpretation. Therefore, anything that is not a main track is other than a main track.

Locomotive

A non-MU control cab locomotive is a controlling locomotive only if its controls are set up to control the locomotive actually providing tractive power, and it controls the movement of train.

Switch providing access

When the protected equipment is standing on an entrance switch so as to prevent other equipment from entering the track through that switch, it ceases to be an access switch. However, once the switch becomes exposed so as to permit other equipment to enter the protected track and couple to the protected cars, it becomes a switch providing access.

Group of workmen

A group could be made up of a number of workmen drawn from a number of diverse crafts. The cohesive ingredients involved if they are to be considered as a *group of workmen* for the purposes of this part are:
(1) that they are assigned to work together as a unit under a common authority (such as a leadman, roundhouse foreman, or car shop foreman); and
(2) that members of the group are in communication with each other while the work is being performed.

The following three sections are similar to sections found in other parts of the CFR and are not reproduced in this manual in order to conserve space; however, Inspectors should familiarize themselves with their content.

§ 218.7 Waivers
§ 218.9 Civil penalty
§ 218.11 Filing, testing, and instructions

Regulation

Subpart B - Blue Signal Protection of Workmen

§ 218.21 Scope.

This subpart prescribes minimum requirements for the protection of railroad employees engaged in the inspection, testing, repair, and servicing of rolling equipment whose activities require them to work on, under, or between such equipment and subjects them to the danger of personal injury posed by any movement of such equipment.

Interpretation

The rationale in developing the language of this section was that generally the type of

work rather than a craft designation require an employee to go on, under, or between rolling equipment. In so doing, the employee would position himself in close proximity to the equipment, where he would be vulnerable to the possibility of a serious personal injury if an unexpected movement of the equipment were to occur. However, in identifying those work activities and positions in relation to railroad rolling stock in such broad terms, it was inevitable that they would encompass a number of specific jobs which did not expose the workman to injury. Therefore, it is not solely the work being done (inspection, testing, repairing, or servicing) but where the employee is positioned in relation to the equipment (being on, under, or between) that would place the employee in a hazardous position.

Many times non-hazardous work will be combined with work that is, and blue signals will be required. However, there may be times when certain non-hazardous work can be isolated in such a manner that blue signal protection would not be required. As an example, equipment inspections that can be made by an employee from a position on the ground alongside the equipment do not represent a hazardous situation. Testing of an air brake system, when purely visual in nature, which requires an employee to board a caboose to read the air pressure gauge or to observe the position of an air brake piston while standing on the ground beside the caboose is another example of a non-hazardous situation.

Certain servicing activities can be carried out without exposure to injury. Examples of such activities would be bleeding of the air brake system on cars, oiling journal boxes, passenger coach interior cleaning not requiring use of ladders, washing the exterior of passenger equipment, evacuating and recharging passenger car soil holding tanks, and supplying passenger cars with water and locomotives with fuel by attaching a hose to an exterior outlet. Similarly, certain supplying activities such as supplying locomotives and cabooses with ice, water, fusees, stationery and paper toweling can be carried out without exposure to injury. These and like activities when effectively confined to the specific non-hazardous work function, and when not combined with work which poses an obvious hazard, would not require blue signal protection. There are certain activities that definitely call for the display of blue signals. Examples of such activities are breaking or making air hose connections, connecting or disconnecting electric control cables between equipment, installing/removing/servicing/repair of rear end devices (markers/telemetry units) and initial terminal air brake tests when workmen are required to go on, under, or between rolling equipment. All these and other activities do cause the workman to position himself in such a way that he is vulnerable to personal injury. In the event a workman has to position himself between the rails at the end of a car, as when changing a knuckle or air hose, blue signal protection would be required. When the work requires the workman to be on, under, or between rolling equipment, then blue signals unquestionably are required. It is the function being performed that determines the protective provisions of the rule, rather than the craft of the employee.

It should also be noted that the blue signal regulation does not cover derailment situations. Assuring protection for workmen involved in such operations is the responsibility of the railroad in accordance with its own operating rules. Requiring blue signals under these circumstances would unreasonably hamper re-railing operations. Unlike routine operations, all involved in this type of work are aware of the special conditions that exist, and expect workmen to be in the area.

§ 218.23 Blue signal display

(a) Blue Signals displayed in accordance with §§ 218.25, 218.27, or 218.29 signify that workmen are on, under, or between rolling equipment. When so displayed-
(1) The equipment may not be coupled to;
(2) The equipment may not be moved, except as provided for in § 218.29;
(3) Other rolling equipment may not be placed on the same track so as to reduce or block the view of a blue signal, except as provided for in § 218.29(a), (b) and (c); and
(4) Rolling equipment may not pass a displayed blue signal.

(b) Blue Signals must be displayed in accordance with §§ 218.25, 218.27 or 218.29 by each craft or group of workmen prior to their going on, under or between rolling equipment and may only be removed by the same craft or group that displayed them.

Interpretation

Basically the use of a blue signal follows the traditional use made of it in the railroad industry prior to the regulation.

The regulation states that blue signals may only be removed by the same craft or group that displayed them. It need not be the same individual, just the same craft or group. If a particular workman is not part of a group as indicated by the regulation's definition, then he would have to display his own blue signal. If a railroad chooses to adopt the policy of having different crafts or groups attach an individual disc to a common blue signal and having the last workman removing his disc also remove the common blue signal, that practice would comply with the intent of the regulation.

Use of blue signals to protect mechanized track maintenance operations would be contrary to the intent of the regulation. Under railroad operating rules, flags of another color have been designated for this purpose, and those rules specify the exact manner in which they are to be displayed to provide protection for such operations.

Federal Railroad Administration

The use of blue signals and derails by industries served by railroads as called for under Department of Labor, Occupational Safety and Health Administration (OSHA) **and Hazardous Materials** regulations for the protection of industry employees involved in the loading and unloading of railroad cars, is not part of **Subpart B - Blue Signal Protection for Workmen;** however, once a blue signal is displayed on tracks or on rolling equipment, regardless under what or whose authority that signal is displayed, railroad employees must respect the signal in compliance with the requirements of this regulation. Blue signals displayed by industry employees must not be removed by railroad employees.

Defect Codes

The following codes are to be used on the F 6180.59 when reporting inspections of blue signal for compliance with this part.

218.023	A. 1.	Equipment coupled to while under displayed blue signal protection.
	A. 2.	Equipment moved while under displayed blue signal protection (except as provided for in § 218.29).
	A. 3.	Other rolling equipment placed on the same track that reduces or blocks the view of a blue signal (except as provided for in § 218.29 (a), (b) and (c).
	A. 4.	Rolling equipment allowed to pass a displayed blue signal.
	B. 1.	Blue signals not displayed in accordance with § 218.25, 218.27 or 218.29 by each craft or group of workmen.
	B. 2.	Blue signal protection removed by someone other than by the same craft or group of workmen that displayed it.

Regulation

§ 218.25 Workmen on a main track

When workmen are on, under, or between rolling equipment on a main track:
(a) A blue signal must be displayed at each end of the of the rolling equipment; and

(b) If the rolling equipment to be protected includes one or more locomotives, a blue signal must be attached to the controlling locomotive at a location where it is readily visible to the engineman or operator at the controls of that locomotive.

(c) When emergency repair work is to be done on, under, or between a locomotive or one or more cars coupled to a locomotive, and blue signals are not available, the engineman or operator must be notified and effective measures taken to protect the workmen making the repairs.

[44 FR 2175, Jan. 10, 1979, as amended at 48 FR 6123, Feb. 10, 1983]

Interpretation

The blue signal displayed at each end of the rolling equipment may be attached to the ends of the equipment, or it may be displayed on the track ahead and behind the equipment as long as there is no doubt about the track and equipment to which it applies. The absence of a blue signal at any one of the required locations (ahead, behind, or on the controlling locomotive) means that the equipment is unprotected and other than the assigned train crew, employees may not work on, under, or between that equipment.

When a signal is displayed on a controlling locomotive, it must be attached to that locomotive in such a manner that there is no doubt but that it is readily visible to an operator seated at the controls of that locomotive. The signal should be placed so that the operator does not have to look for it, such as a clamp hanging from the window sill with the signal positioned low on the carbody of the locomotive. In other words, the signal must be immediately visible to the operator without any effort on his part.

The emergency provisions were intended to allow the railroad flexibility when a train is stopped on the main line under emergency circumstances. Under these conditions the provision can be used when blue signals are not available, provided that the train and engine crew has full control over train movement. They were not intended to be used simply because the carrier neglected to maintain a sufficient supply of blue signals for normal use.

In any case, the measures taken must be effective to the extent that the safety of the workman is assured.

Where a mechanical department employee is assigned to accompany a train between terminals to monitor the performance of a piece of equipment, or to accompany a dimensional load, he is considered the same as if he were a crew member.

Note: The "emergency provisions" are for locations where no "blue signals" are available.

Making inspections: Normally, there are few locations that routinely perform work requiring blue signal protection on a main line. An exception to this is when the carrier maintains a fuel and servicing facility on a main line for through trains. At a location such as this, first determine if any work is being done that requires protection. Remember that there are certain exceptions to what constitutes servicing and testing, and fueling is considered one of these exceptions.

The important thing to realize when observing blue signal protection provided on a main line is that the regulation does not require lined and locked switches, or the application of derails under these circumstances. However, blue signals must still be applied at each end of the equipment to be protected. Check to see if this has been done. Also, if one or more locomotives are among the protected equipment, then a blue signal must be attached to the controlling locomotive at a location where it is readily visible to someone seated at the controls of that locomotive. Evaluate if this blue signal would be obvious to someone at those controls. Some flags that are hung from the side of the cab are not.

Defect Codes

The following codes are to be used on the F 6180.59 when reporting results of blue signal inspections made while one or more workmen were on, under or between rolling equipment on a main track.

218.025	A. 1.	Blue signal protection properly displayed.
	A. 2.	Blue signal not displayed at one end of rolling equipment.
	A. 3.	Blue signals not displayed at either end of rolling equipment.
	B. 1.	Blue signal not attached to controlling locomotive.

B. 2.	Blue signal attached to controlling locomotive but in a manner that it is not readily visible to an operator at the controls (explain).
C. 1.	Engineman or operator not notified when emergency repair work is in progress.
C. 2.	Engineman or operator not at or near the locomotive controls when emergency repair work is being done.
C. 3.	Effective measures not taken to protect workmen making emergency repairs (explain).

Regulation

§ 218.27 Workmen on track other than main track.

When workmen are on, under or between rolling equipment on track other main track--

(a) A blue signal must be displayed at or near each manually operated switch providing access to that track;

(b) Each manually operated switch providing access to the track on which the equipment is located must be lined against movement to that track and locked with an effective locking device; and

(c) The person in charge of the workmen must have notified the operator of any remotely controlled switch that work is to be performed and have been informed by the operator that each remotely controlled switch providing access to the track on which the equipment is located has been lined against movement to that track and locked as prescribed in § 218.30.

(d) If rolling equipment requiring blue signal protection as provided for in this section is on a track equipped with one or more crossovers, both switches of each crossover must be lined against movement through the crossover toward that rolling equipment, and the switch of each crossover that provides access to the rolling equipment must be protected in accordance with the provisions of paragraphs (a) and (b), or (c) of this section.

(e) If the rolling equipment to be protected includes one or more locomotives, a blue signal must be attached to the controlling locomotive at a location where it is readily visible to the engineman or operator at the controls of that locomotive.

Interpretation

A blue signal displayed at or near a manually operated switch providing access to the track must be displayed no farther into the track than the fouling point of that entrance switch.

The absence of a blue signal, or an unlocked manual or remotely controlled switch providing access to a track means that the track is unprotected, and workmen may not work on, under, or between equipment on that track.

Rolling equipment may not enter or depart a protected track. However, after all work activity has ceased and the workmen have been notified to stand clear and blue signal protection has been removed from the switch through which the equipment will move, rolling equipment may enter or depart a protected track.

The blue signal is to be displayed at a location where it is readily visible to the engineman or operator at the controls of the **controlling** locomotive. A blue signal attached to the controls of the controlling locomotive or attached in front or side of the engineman or operator's view would comply. If it is an unlighted device displayed at night, then it must be attached to the controls, and the cab must be lighted so that the device is clearly distinguishable.

When a crossover switch leads into the track on which protected equipment is standing, the switches at both ends of the crossover must be lined against entry into the protected track. The switch at the end of that crossover which connects directly to the protected track must be locked, and a blue signal must be displayed at that locked switch. However, if protected equipment is standing on the switch of such a crossover so as to block other equipment moves from entering the protected track through that crossover, the switch need not be locked or blue signal displayed.

A blue signal displayed at a derail, locked in a derailing position on a track which is being used to fulfill the requirements of a manually operated switch on that track, does not prevent other moving equipment from entering that track. But of course, this other moving equipment may not pass the blue signal protection.

When workmen are engaged in work on a train with the rear portion standing on a track other than a main track, and the head end portion out on a main track, then the rear portion must be protected in accordance with § 218.27, "Workmen on track other than

a main track." However, the head end would be protected by a blue signal ahead of the locomotive and one attached to the controlling locomotive in accordance with § 218.25, "Workmen on main track."

Making inspections: This is the type of blue signal protection you would expect to find during a train yard inspection. When making an observation of this kind, great care must be exercised in determining what protection is required, and where it must be placed.

If you observe workmen on, under, or between rolling equipment on a particular track, and find no lock on the switch for that track, before deciding that adequate protection is not being provided' check to see if a derail and blue signal have been applied as an alternate method of protection. This is acceptable if provided in accordance with § 218.29(c) (1) and (2). If none is found, check to see if a switch previous to the one you looked at is locked. If so, and if that switch effectively prevents any possible movement onto the track where work is being performed, then the intent of the regulation has been met. If any question still exists, contact a railroad official and ask him to describe the procedure used at his facility and whether is proper.

If the protection provided appears satisfactory by visual observation, there are several more steps to take. When a manual switch or derail provides protection, tug on the lock to see if it is effective. Instances have been found where workmen, not wanting to bother with a key, have used defective locks that, while appearing locked, may be opened by hand. Next, attempt to move the manual switch or derail. Sometimes this can be accomplished even with the lock in place. If so, it may be due either to worn components, or possibly an undersize lock hasp allowing it to be bypassed.

Normally, there are few locations that routinely perform work requiring blue signal protection on a main line. An exception to this is when the carrier maintains a fuel and servicing facility on a main line for through trains. At a location such as this, first determine if any work is being done that requires protection. Remember that there are certain exceptions to what constitutes servicing and testing, and fueling is considered one of these exceptions.

The important thing to realize when observing blue signal protection provided on a main line is that the regulation does not require lined and locked switches, or the application of derails under these circumstances. However, blue signals must still be applied at each end of the equipment to be protected. Check to see if this has been done. Also, if one or more locomotives are among the protected equipment, then a blue signal must be attached to the controlling locomotive at a location where it is readily visible to someone at the controls of that locomotive. Evaluate if this blue signal would be obvious to someone at those controls. Some flags that are hung from the side of the cab are not.

Federal Railroad Administration

Defect Codes

The following codes are to used on the F 6180.59 when reporting results of blue signal inspections made while one or more workmen were on, under or between rolling equipment on a track other than a main track.

218.027	A. 1.	Blue signal protection properly displayed.
For switches providing access		
218.027	A. 2.	Blue signal not displayed at one manually operated switch.
	A. 3.	Blue signal not displayed at either manually operated switch.
	B. 1.	One switch not lined against movement.
	B. 2.	Neither switch lined against movement.
	B. 3.	one switch not locked.
	B. 4.	Neither switch locked.
	B. 5.	Locking device on switch not effective.
	C. 1.	Failure of person in charge to notify operator of remotely controlled switch.
	C. 2.	No acknowledgement from operator of remotely controlled switch that it has been lined and locked against movement.
	D. 1.	One crossover switch providing access to protected track not lined against movement.
	D. 2.	Two or more crossover switches providing access to protected track not lined against movement.
	D. 3.	One crossover switch providing access to protected track not locked.

	D. 4.	Two or more crossover switches providing access to protected track not locked.

For locomotive on protected track

218.027	E. 1.	Blue signal not attached to controlling locomotive.
	E. 2.	Blue signal attached to controlling locomotive but in a manner that it is not readily visible to an operator at the controls (explain).

Regulation

§ 218.29 Alternate methods of protection.

Instead of providing blue signal protection for workmen in accordance with § 218.27, the following methods for blue signal protection may be used:

(a) When workmen are on, under, or between rolling equipment in a locomotive servicing area:
(1) A blue signal must be displayed at or near each switch providing entrance to or departure from the area;
(2) Each switch providing entrance to or departure from the area must be lined against movement to the area an locked with an effective locking device; and
(3) A blue signal must be attached to each controlling locomotive at a location where it is readily visible to the engineman or operator at the controls of that locomotive;
(4) If the speed within the area is restricted to not more than 5 miles per hour a derail, capable of restricting access to that portion of a track within the area on which the rolling equipment is located, will fulfill the requirements of a manually operated switch in compliance with paragraph (a)(2) of this section when positioned at least 50 feet from the end of the equipment to be protected by the blue signal, when locked in a derailing position with an effective locking device, and when a blue signal is displayed at the derail;
(5) A locomotive may be moved onto a locomotive servicing area track after the blue signal has been removed from the entrance switch to the area. However, the locomotive must be stopped short of coupling to another locomotive;
(6) A locomotive may be moved off of a locomotive servicing area track after the blue signal has been removed from the controlling locomotive to be moved and from the area departure switch;
(7) If operated by an authorized employee under the direction of the person in

charge of the workmen, a locomotive protected by blue signals may be repositioned within this area after the blue signal has been removed from the locomotive to be repositioned and the workmen on the affected track have been notified of the movement; and
(8) Blue signal protection removed for the movement of locomotives as provided in paragraphs (a)(5) and (6) of this section must be restored immediately after the locomotive has cleared the switch.

(b) When workmen are on, under, or between rolling equipment in a car shop repair track area:
(1) A blue signal must be displayed at or near each switch providing entrance to or departure from the area; and
(2) Each switch providing entrance to or departure from the area must be lined against movement to the area and locked with an effective locking device;
(3) If the speed within the area is restricted to not more than 5 miles per hour, a derail capable of restricting access to that portion of a track within the area on which the rolling equipment is located will fulfill the requirements of a manually operated switch in compliance with paragraph (a)(2) of this section when positioned at least 50 feet from the end of the equipment to be protected by the blue signal, when locked in a derailing position with an effective locking device and when a blue signal is displayed at the derail;
(4) If operated by an authorized employee under the direction of the person in charge of the workmen, a car mover may be used to reposition rolling equipment within this area after workmen on the affected track have been notified of the movement.

(c) Except as provided in paragraphs (a) and (b) of this section, when workmen are on, under, or between rolling equipment on any track, other than a main track:
(1) A derail capable of restricting access to that portion of the track on which such equipment is located, will fulfill the requirements of a manually operated switch when positioned no less than 150 feet from the end of such equipment; and
(2) Each derail must be locked in a derailing position with an effective locking device and a blue signal must be displayed at each derail.

(d) When emergency repair work is to be done on, under, or between a locomotive or one or more cars coupled to a locomotive, and blue signals are not available, the engineman or operator at the controls of that locomotive must be notified and effective measures must be taken to protect the workmen making the repairs.

Interpretation

This Section 218.29 provides a railroad with an alternate method of establishing blue

signal protection for equipment occupying tracks in locomotive servicing and car shop repair track areas. A railroad may establish blue signal protection in accordance with 218.27, "Workmen On Track Other Than Main Track", or in accordance with this section.

Basically, § 218.27 requires blue signal protection be established for each track, while this Section permits blue signal protection to be established for the area as a whole. It provides greater flexibility for movement of equipment within, as well as to and from, the area. This Section also authorizes use of a derail, under the restrictions set forth, to fulfill the requirements of a manually operated switch.

Blue signals must be attached to the controlling locomotive whenever workmen are on, under, or between any rolling stock and that locomotive. A locomotive not blue flagged, within the area, can be moved without removing blue signals displayed at the entrance switches provided:
(1) that the locomotive does not impact or couple to a locomotive on which a blue signal is displayed;
(2) that the locomotive is operated by an authorized employee under the direction of the person in charge of the workmen; and
(3) only after the workmen on the track have been notified of the movement and have suspended the work.

This Section also authorizes the use of a locked derail to fulfill the requirements of a manually operated switch on any track, other than a main track, when placed at a minimum distance of 150 feet from the end of the protected equipment. If speed is restricted to less than 5 miles per hour, then this distance may be **reduced** to no less than 50 feet when used in locomotive servicing and car shop repair track areas.

If a derail is used, it must be locked in a derailing position with an effective locking device and a blue signal must be displayed.

When "emergency" repair work is to be done on, under, or between a locomotive and one or more cars coupled to a locomotive, and blue signals are not available, the engineman or operator at the controls of that locomotive must be notified and effective measures must be taken to protect the workmen making the repairs. The "emergency provision" provides an alternative means of providing protection for workmen, whenever a train is stopped under emergency circumstances and blue signals are not available. The emergency must occur when the trains movement is being controlled by the assigned train crew.

Making inspections: Instead of providing blue signal protection in accordance with § 218.27, alternate methods of protection can be found in § 218.29. This is true for all

tracks, other than main tracks, including locomotive servicing and car shop repair track areas. For servicing and repair areas, this basically allows a railroad to provide blue signal protection for the work area as a whole, rather than individual tracks.

When inspecting for the adequacy of blue signal protection in a locomotive servicing or car repair track area, first determine if workmen are on, under, or between rolling equipment. Then determine if protection provided at each track providing a means of entrance into the area is proper. Are the blue signals displayed. Physically test any locks and manual switches and derails. Next, observe the operations inside the area for compliance.

Keep in mind when using the alternate method in locomotive areas, every locomotive workmen are on, under, or between requires a blue signal attached to each controlling locomotive where it is readily visible to the operator at the controls of that locomotive. This means that if, for instance, three locomotives are coupled together and workman are engaged in inspection, testing, repair, or servicing of one of them, then one of the following applies:

(1). If their control cables and MU hoses are connected so that all three respond to the control settings of one, (the lead unit), then that is the controlling unit, and the one that requires an attached blue signal.

(2). If the locomotive control cables and MU hoses are not connected in such a manner that causes them to respond to the control settings of another, then the locomotive that the workmen are on requires the attached blue signal. In order to fully comply with these regulations a blue signal should be attached to all locomotives that are capable of being used as a controlling unit before the locomotive control cables and MU cables are connected.

In addition to the above **any** locomotive that is capable of being used as a controlling locomotive also requires the application of a blue signal visible to the operator when the following conditions apply:

(1). When coupled to a locomotive that workmen are on, under, or between; and

(2). A coupled locomotive that may be moved from the **controlling** locomotive without the necessity of the operator or helper repositioning the controls of the locomotive that the workmen are on. (note: other than controlling locomotive, a controller, reverser, when possible should not be left in control stand with generator field switch on.)

Remember that provision has been made in the regulation, for using alternate methods to reposition rolling equipment within the area. However, this may only be done when

all conditions of the regulation are met.

Defect Codes

The following codes are to be used on the F 6180.59 for reporting results of blue signal inspections made when an alternate method of protection is being used to protect one or more workmen on, under, or between rolling equipment.

For locomotive servicing area

218.029	A. 1.	Blue signal protection properly displayed.
	A. 2.	Blue signal not displayed at each switch providing area access.
	A. 3.	Switch providing area access not lined against movement.
	A. 4.	Switch providing area access not locked.
	A. 5.	Ineffective locking device on switch providing area access.
	A. 6.	Blue signal not attached to controlling locomotive.
	A. 7.	Blue signal attached to controlling locomotive but in a manner that it is not readily visible to an operator at the controls (explain).

When a derail is used to protect locomotive servicing area

218.029	B. 1.	Speed exceeds 5 miles per hour in area.
	B. 2.	Protected equipment within 50 feet of derail.
	B. 3.	Blue signal not displayed at derail.
	B. 4.	Derail not applied in derailing position.
	B. 5.	Derail not locked.

	B. 6.	Ineffective locking device on derail.

Movement in locomotive servicing area

218.029	C. 1.	Locomotive moved into area and coupled to protected equipment.
	C. 2.	Locomotive moved within or off area without removal of blue signals.
	C. 3.	Locomotive moved in area by unauthorized person.
	C. 4.	Locomotive repositioned without notifying workmen on affected track.
	C. 5.	Blue signal protection not immediately restored following movement in/out of locomotive servicing area.
	C. 6.	Workmen were not notified prior to movement of equipment on track where they were performing duties which required protection.

For car shop repair track area

218.029	D. 1.	Blue signal protection properly displayed.
	D. 2.	Blue signal not displayed at each switch providing area access.
	D. 3.	Switch providing area access not lined against movement.
	D. 4.	Switch providing area access not locked.
	D. 5.	Ineffective locking device on switch providing area access.
	D. 6.	Workmen were not notified prior to movement of track where they were

performing duties which required protection.

When a derail is used to protect car shop repair track area

218.029	E. 1.	Speed exceeds 5 miles per hour in area.
	E. 2.	Protected equipment within 50 feet of derail.
	E. 3.	Blue signal not displayed at derail.
	E. 4.	Derail not applied in derailing position.
	E. 5.	Derail not locked.
	E. 6.	Ineffective locking device on derail.
	E. 7.	Equipment moved in area by unauthorized person.
	E. 8.	Equipment moved in area without notifying workmen on affected track.

Derail used on other than main track (including locomotive and car mechanical areas when speed exceeds 5 MPH)

218.029	F. 1.	Protected equipment within 150 feet of derail.
	F. 2.	Blue signal not displayed at derail.
	F. 3.	Derail not applied in derailing position.
	F. 4.	Derail not locked.
	F. 5.	Ineffective locking device on derail.

Emergency provisions

218.029	F. 6.	Engineman or operator not notified when emergency repair work is in progress.
	F. 7.	Engineman or operator not at or near the

locomotive controls when emergency repair work is being done.

F. 8. Effective measures not taken to protect workmen making emergency repairs (explain).

F. 9. Blue signals available and not used.

Regulation

§ 218.30 Remotely controlled switches

(a) After the operator of the remotely controlled switches has received the notification required by § 218.27(c), he must line each remotely controlled switch against movement to that track and apply an effective locking device to the lever, button, or other device controlling the switch before he may inform the employee in charge of the workmen that protection has been provided.

(b) The operator may not remove the locking device unless he has been informed by the person in charge of the workmen that it is safe to do so.

(c) The operator must maintain for 15 days a written record of each notification which contains the following information:
(1) The name and craft of the employee in charge who provided the notification;
(2) The number or other designation of the track involved;
(3) The date and time the operator notified the employee in charge that protection had been provided in accordance with paragraph (a) of this section; and
(4) The date and time the operator was informed that the work had been completed, and the name and craft of the employee in charge who provided this information.

Interpretation

The operator referred to in this Section is the employee who has been delegated the responsibility for the proper and safe operation of the control board.

When the term *effective locking device* is used in reference to a remotely controlled switch, it need not be a padlock, but may be a plug or key, which when properly inserted into the control panel of the installation serves to immobilize the switch control lever being used to establish protection. The device must be applied in such a manner that the control lever cannot be thrown for the route into the protected track without first

removing the locking device. Whatever type locking device is utilized to immobilize the switch lever or button, it must effectively prevent it from being moved. A written tag alone, attached to the lever or button, which does not prevent the lever or button from being manipulated, would not comply. Any remotely controlled switch that can be overridden in the field by use of a manual lever, without obtaining prior authority and taking that switch out of power, would have to be treated as a manual switch and be locked in the field.

Making Inspections: Occasionally, a track on which blue signal protection is to be applied will have one or more switches that provide access to that track remotely controlled. If this is the case, certain measures must be taken by the carrier to insure adequate protection. When you find a location like this, check where these switches are being controlled.

An inspection should be made of the written records the railroad is required to maintain. The written records should be inspected for their completeness as to: (1) the date and time the operator received notification of the work to be performed; (2) the name and craft of the employee in charge who provided the notification; (3) the number or other designation of the track involved; (4) the date and time the operator notified the employee in charge that protection had been provided in accordance with paragraph (a) of this section; and (5) the date and time the operator was informed that the work had been completed, and the name and craft of the employe in charge who provided this information. Such written records should be made at once and never from memory or memoranda.

Check if effective locking devices are being applied to remotely controlled switches. Traditionally, levers, buttons and other similar devices have been used to control these switches. Mechanical locking devices e.g. pins, clamps, sleeves, buttons or toggles would then be applied to these devices to prevent accidental removal of the protection.

Increasingly, computer keyboards are now being used in place of levers, buttons, etc., to operate remotely controlled switches. The safeguard against accidental movement of a protected switch may not be so obvious with these. Applying a padlock, plug, or key would be impractical. The generally used method is for the computer program to require one or more extra entries with the keyboard before releasing the switch for movement. If only one additional step is required, evaluate whether forces the operator to realize he is attempting to move a switch which has had blue signal protection applied to it. If you have a question, concerning sufficient protection being provided, ask the operator to describe what steps he must take. Can he/she provide and remove switch protection for each individual group of workmen, or only for all employees at once. Remember, if more than one class, craft, or group of employees is working on rolling equipment, then **each** group will require separate protection. The computer program must allow for this,

as well as the minimum one extra entry before release of a protected switch.

Regardless of the method used to operate remotely controlled switches, remember that the intent of the locking device provision is to force the operator to make some special effort to move a protected switch. This causes him to recall that there are workmen on rolling equipment on that track. Use good judgement in determining if this has been accomplished.

Reporting inspection results: Inspections of remotely controlled switches will require a different reporting procedure. In most cases blue signal inspection reporting may be entered on F 6180.59 together with any equipment-related inspection results. This is true for any blue signal inspections, except when remotely controlled switches are involved. The reason for this is that in most cases control of blue signal protection is under the direct supervision of the mechanical department. Therefore, blue signal and equipment can be combined on the same report and presented to the responsible mechanical department official for handling. However, in the case of remotely controlled switches, a separate report on Form 6180.59 with its own number will be required.

It is best to leave a copy of your report with a railroad official directly responsible for the type of condition found. Remotely controlled switches usually are under the control of the transportation department, and defects must be handled with them for correction. Equipment conditions should be handled separately with a mechanical official; therefore, the need for separate reports. Because a failure in protection of a remotely controlled switch may impact on mechanical personnel, the most appropriate procedure is to also leave a copy of this separate report with the mechanical department.

Defect Codes

The following codes are to be used on the F 6180.59 for reporting results of blue signal inspections made of remotely controlled switches when used to protect one or more workmen on, under or between rolling equipment.

218.030	A. 1.	Blue signal protection properly displayed.
	A. 2.	No locking device applied to switch control.
	A. 3.	Locking device on switch control not effective.
	B. 1.	No written notification record.
	B. 2.	Written notification record incomplete/ does

not contain all the required information.

Note: the total number of records inspected is to be shown on the F 6180.59 on item 12 (G) as would be done when showing inspection of loco/car records.

Summary of Defect Codes
Subpart B - Blue Signal Protection of Workmen

The following reporting codes are to be used on the F 6180.59 for observations of blue signal inspections made while one or more workmen are on, under or between rolling equipment.

218.023	A. 1.	Equipment coupled to while under displayed blue signal protection.
	A. 2.	Equipment moved while under displayed blue signal protection (except as provided for in § 218.29).
	A. 3.	Other rolling equipment placed on the same track that reduces or blocks the view of a blue signal (except as provided for in § 218.29 (a), (b) and (c).
	A. 4.	Rolling equipment allowed to pass a displayed blue signal.
	B. 1.	Blue signals not displayed in accordance with § 218.25, 218.27 or 218.29 by each craft or group of workmen.
	B. 2.	Blue signal protection removed by someone other than by the same craft or group of workmen that displayed it.

The following codes are to be used the F 6180.59, when reporting results of blue signal inspections made while one or more workmen were on, under, or between rolling equipment on a main track.

218.025	A. 1.	Blue signal protection properly displayed.

	A. 2.	Blue signal not displayed at one end of rolling equipment.
	A. 3.	Blue signals not displayed at either end of rolling equipment.
	B. 1.	Blue signal not attached to controlling locomotive.
	B. 2.	Blue signal attached to controlling locomotive but in a manner that it is not readily visible to an operator at the controls (explain).
	C. 1.	Engineman or operator not notified when emergency repair work is in progress.
	C. 2.	Engineman or operator not at or near the locomotive controls when emergency repair work is being done.
	C. 3.	Effective measures not taken to protect workmen making emergency repairs (explain).

The following codes are to used on the F 6180.59 when reporting results of blue signal inspections made while one or more workmen were on, under, or between rolling equipment on a track other than a main track.

218.027	A. 1.	Blue signal protection properly displayed.

For switches providing access

218.027	A. 2.	Blue signal not displayed at one manually operated switch.
	A. 3.	Blue signal not displayed at either manually operated switch.
	B. 1.	One switch not lined against movement.
	B. 2.	Neither switch lined against movement.

	B. 3.	one switch not locked.
	B. 4.	Neither switch locked.
	B. 5.	Locking device on switch not effective.
	C. 1.	Failure of person in charge to notify operator of remotely controlled switch.
	C. 2.	No acknowledgement from operator of remotely controlled switch that it has been lined and locked against movement.
	D. 1.	One crossover switch providing access to protected track not lined against movement.
	D. 2.	Two or more crossover switches providing access to protected track not lined against movement.
	D. 3.	One crossover switch providing access to protected track not locked.
	D. 4.	Two or more crossover switches providing access to protected track not locked.

For locomotive on protected track

218.027	E. 1.	Blue signal not attached to controlling locomotive.
	E. 2.	Blue signal attached to controlling locomotive but in a manner that it is not readily visible to an operator at the controls (explain).

The following codes are to be used on the F 6180.59 for reporting results of blue signal inspections made when an alternate method of protection is being used to protect one or more workmen on, under, or between rolling equipment.

For locomotive servicing area

218.029	A. 1.	Blue signal protection properly displayed.
	A. 2.	Blue signal not displayed at each switch providing area access.
	A. 3.	Switch providing area access not lined against movement.
	A. 4.	Switch providing area access not locked.
	A. 5.	Ineffective locking device on switch providing area access.
	A. 6.	Blue signal not attached to controlling locomotive.
	A. 7.	Blue signal attached to controlling locomotive but in a manner that it is not readily visible to an operator at the controls (explain).

When a derail is used to protect locomotive servicing area

218.029	B. 1.	Speed exceeds 5 miles per hour in area.
	B. 2.	Protected equipment within 50 feet of derail.
	B. 3.	Blue signal not displayed at derail.
	B. 4.	Derail not applied in derailing position.
	B. 5.	Derail not locked.
	B. 6.	Ineffective locking device on derail.

Movement in locomotive servicing area

218.029	C. 1.	Locomotive moved into area and coupled to protected equipment.

	C. 2.	Locomotive moved within or off area without removal of blue signals.
	C. 3.	Locomotive moved in area by unauthorized person.
	C. 4.	Locomotive repositioned without notifying workmen on affected track.
	C. 5.	Blue signal protection not immediately restored following movement in/out of locomotive servicing area.
	C. 6.	Workmen were not notified prior to movement of equipment on track where they were performing duties which required protection.

For car shop repair track area

218.029	D. 1.	Blue signal protection properly displayed.
	D. 2.	Blue signal not displayed at each switch providing area access.
	D. 3.	Switch providing area access not lined against movement.
	D. 4.	Switch providing area access not locked.
	D. 5.	Ineffective locking device on switch providing area access.
	D. 6.	Workmen were not notified prior to movement of track where they were performing duties which required protection.

When a derail is used to protect car shop repair track area

218.029	E. 1.	Speed exceeds 5 miles per hour in area.
	E. 2.	Protected equipment within 50 feet of derail.

	E. 3.	Blue signal not displayed at derail.
	E. 4.	Derail not applied in derailing position.
	E. 5.	Derail not locked.
	E. 6.	Ineffective locking device on derail.
	E. 7.	Equipment moved in area by unauthorized person.
	E. 8.	Equipment moved in area without notifying workmen on affected track.

Derail used on other than main track (including locomotive and car mechanical areas when speed exceeds 5 MPH)

218.029	F. 1.	Protected equipment within 150 feet of derail.
	F. 2.	Blue signal not displayed at derail.
	F. 3.	Derail not applied in derailing position.
	F. 4.	Derail not locked.
	F. 5.	Ineffective locking device on derail.

Emergency provisions

218.029	F. 6.	Engineman or operator not notified when emergency repair work is in progress.
	F. 7.	Engineman or operator not at or near the locomotive controls when emergency repair work is being done.
	F. 8.	Effective measures not taken to protect workmen making emergency repairs (explain).
	F. 9.	Blue signals available and not used.

The following codes are to be used on the F 6180.59 for reporting results of blue signal inspections made of remotely controlled switches when used to protect one or more workmen on, under, or between rolling equipment.

218.030	A. 1.	Blue signal protection properly displayed.
	A. 2.	No locking device applied to switch control.
	A. 3.	Locking device on switch control not effective.
	B. 1.	No written notification record.
	B. 2.	Written notification record incomplete/ does not contain all the required information.

Note: the total number of records inspected is to be shown on the F 6180.59 on item 12 (G) as would be done when showing inspection of locomotive/car records.

Chapter 8

Railroad Locomotive Safety Standards

Introduction

The Federal Railroad Administration revised those sections of 49 CFR Part 230 that dealt with Other Than Steam Locomotives, and codified them under Part 229, which became effective on May 1, 1980.

The Inspector should follow the procedures given in this manual to assess the need for locomotive safety corrective procedures. The Motive Power and Equipment Inspector must determine if conditions observed acutely impact on the safe operation of locomotives. When trains, power units, or equipment is inspected or examined by an MP&E Inspector and he/she concludes deficiencies exist which may not be conducive to safe rail operation, the Inspector must decide if the defects:

- are encompassed in Federal regulations (i.e., meets the definition of what constitutes a Federal defect)
- should be included in the Motive Power and Equipment Report (F 6180.59)
- warrants the issuance of a violation report.
- should be reported to the railroad as an unsafe condition which is not encompassed in Federal regulations.

The following brief discussion summarizes guidelines to be used by Federal and State Inspectors when conducting field inspections for compliance or enforcement activity. Enforcement policies, must be adhered to by each Inspector, who is to conduct inspections of locomotives, passenger cars, or freight cars or observes train air brake tests. From the outcome of the inspection, each Inspector must determine whether each unit inspected, tested, maintained, or operated by railroad personnel, complies with Federal safety requirements.

In an effort to achieve some level of uniformity in the enforcement procedures by all Motive Power and Equipment (MP&E) Inspectors throughout the country, the following guidelines are provided. FRA believes the MP&E Inspector should devote more of

his/her inspection activity to facilities where periodic, annual and biennial tests are performed. After a locomotive receives a periodic inspection and returns to service, it should comply with all the requirements of Part 229 and be free of defects. Keep in mind a locomotive may not be absolutely clean and free of all accumulations of oil, but may still be in compliance. The Locomotive Safety Standards address conditions which create an unsafe working environment, an unsafe condition or an unsafe locomotive. It does not address housekeeping practices of a railroad. If a locomotive is released with a minor non-complying condition from a periodic inspection, it should be brought to the railroads attention for correction. If an unsafe condition is found, the issuance of a **Special Notice for Repairs** and a violation may be considered.

At locations where facilities are located for locomotive fueling and servicing and the calendar day inspections are conducted by mechanical department personnel, the locomotives should be free of non-complying conditions based upon the service for which the locomotive is being prepared. As an example, a road locomotive with an inoperative speed indicator which is assigned to yard service and will operate at speeds of less than 20 mph does not require a speed indicator, and the railroad can legally use such a locomotive in that service. By the same token, if the Inspector's follow-up inspection of a locomotive approved for service by the railroads inspector reveals non-complying conditions which the railroad inspector should have seen and corrected, and is of a serious nature and constitutes an injury hazard, the Inspector should take the locomotive out-of-service. Violations and personal liability procedures should also be considered.

At locations where calendar day inspections are performed by mechanical department personnel and no locomotive service facilities are available, and a Federal or a State Inspector notices atypical or irregular locomotive condition, he/she must meticulously examine and determine the particulars or details of the condition in order to assess if it conforms with interpretations of Federal regulations for these types of defects. Before recording the observed condition as a defect, the Inspector must at a minimum weigh or appraise each essential factor in order to determine that the existing condition either meet, exceed, or is in non-compliance with Federal regulations. If the non-complying condition does not create an unsafe condition, can be repaired at the location and is technical in nature rather than hazardous, the Inspector should consider not reporting it as a defect but have it corrected by the railroad.

At remote yard locations where locomotives are assigned and the calendar day inspection is conducted by the engineer, the FRA Inspector should weigh the caliber of such inspection based upon what engineers are familiar with and their dedication to performing such inspection. Where non-complying conditions are found on locomotives at such a location, it must be brought to the railroads attention. The railroad must also be informed that the locomotive can not legally be used until the non-complying condition is corrected. If calendar day record inspection reports are retained at a remote yard and

the engineer reports non-complying conditions on a locomotive such as excessive brake cylinder piston travel and no sand, and the MP&E Inspector finds both conditions still exist on the locomotive and have not been corrected by the railroad, violations may be submitted. Such violations should be accompanied by all the documentation available and a complete explanation regarding the railroad operation at the location. It is the railroads responsibility to maintain locomotives in compliance with Federal regulations and all reported non-complying conditions corrected before the locomotive may be continued in service.

If an FRA Inspector finds a locomotive assigned for service at a remote yard, without maintenance personnel or facilities, to have a minor defect, he may decide not to take any action given that it is not unsafe and allow the locomotive to continue in service, but the Inspector should not tell the railroad of such a condition. No FRA Inspector has the authority to inform a railroad it may continue to use a locomotive with a non-complying condition. If the non-complying condition is of a minor nature but the MP&E Inspector decides that it must be corrected, he/she should so inform the railroad.

When an Inspector makes a determination and substantiates that a locomotive is unsafe and not in a serviceable condition or being explicitly in nonconformity with Federal regulations, he may issue a **Special Notice For Repair** in writing to the railroad. The Notice should only describe the condition or conditions for which it was issued and not any minor non-complying conditions.

Any railroad employee who authorizes a willful movement or operation of non-complying or unsafe locomotive and who has knowledge of the circumstances could be held personally responsible for the action. The Inspector should judge all pertinent facts and determine if it can be documented that the railroad employee can be cited for willful non-compliance with Federal regulations. Prior to advising a railroad employee that he/she will be cited for a willful violation, the Inspector must coordinate such action in accordance with established procedures. **(See General Manual)**

Locomotive Safety Standards Inspection Procedures

The Motive Power and Equipment Inspector, major duties:

- Monitor railroad compliance with the Locomotive Safety Standards.
- Inspect locomotives to appraise their condition.
- Encourage railroads to correct non-complying conditions.
- Endeavor to have the railroad perform proper inspection and maintenance

practices which enhances compliance with Federal regulations.

- Keep up-to-date, accurate records.

Upon arrival at an inspection point where mechanical department personnel are assigned to perform locomotive inspection, testing and repair, the Inspector should notify the local supervision of his/her presence and intentions. It should be left up to the railroad as to whether an employee will accompany the Inspector. The Inspector should be properly attired and comply with the railroads safety rules. It is not necessary for FRA/State Inspectors to obtain "blue signal" protection in order to perform inspection activity; however, Inspectors should never place themselves in a position where the movement of equipment subjects them to the danger of personal injury. Railroad representative(s), accompanying the Inspector during the inspection, must obtain blue signal protection if that individual(s) engage in activities that require them to work on, under, or between the equipment.

The Inspector should make every effort to perform inspections on locomotives that have been inspected by railroad personnel and offered for service to the transportation department. When non-complying conditions are found on these locomotives, the Inspector is free to use his/her discretion as to what enforcement tools to use. If minor non-complying conditions are found, the Inspector should inform the railroad representative so that corrective action can be taken prior to departure.

Inspection should begin at ground level, examining running gear components, draft arrangements, pilots or snow plows, fuel tanks, foundation brake gear, main reservoir sanding system, emergency fuel cut-off devices and safety appliances. While at ground level, request an operational test of emergency fuel cut-off devices. An Inspector should not take exception to an item as being improperly secured, if the application is made with an approved securement, but is slightly loose. Inspect the upper portion of the locomotive, for **hazardous** water, oil, fuel, and exhaust leaks. If the leaks do not create a hazard, no exception should be taken.

Ensure all rotating equipment is properly guarded and that passageways are free from slipping and tripping hazards. Request a functional test of the engine protection devices for proper operation. Inspect the main generator/alternator compartment for properly guarded and marked, high voltage protection. Inspect the locomotive cab for unsafe conditions, i.e., attachment of cab seats, glazing (Part 223), floors and doors. Check daily inspection record and the F 6180.49 form for technical requirements. If practical observe tests of the air brakes, speed indicators, high voltage ground protection and wheel slip/slide protection. Point out any observed conditions, whether covered by the regulations or not, that would jeopardize employee safety and/or the safe operation of the equipment.

After the inspection, advise the proper railroad representative of all non-complying conditions. Discretion should be used in evaluating the condition of the equipment. The Inspector must decide whether or not to cite the defects on his/her inspection report. However, the railroad must be notified of all cited conditions and they must be corrected prior to the locomotive being used. Inspectors do not have the option of allowing a railroad to use a non-complying locomotive once the defective condition is cited. The **Motive Power and Equipment Inspection Report** (F 6180.59), should be completed and the appropriate copy given to the railroad representative. If the inspection report cannot be prepared immediately after the inspection, it shall be completed within 24 hours and submitted to the railroad.

Daily Inspection

Railroads perform daily inspections of locomotives at various locations; locomotive maintenance facilities, service tracks, fueling pads, classification yards and remote locations where locomotives are assigned. In most instances, FRA inspections should be performed after railroad personnel have completed the daily inspection. In the case of a "captive fleet" of locomotives e.g., local switchers, commuter service, pool freight, etc., good practice is to review the previous daily inspection reports prior to inspecting the locomotives, to verify that any previously reported non-complying conditions were corrected.

Daily inspections conducted at a locomotive maintenance facilities are normally performed by locomotive department employees specifically assigned those duties. At such locations, locomotives should be free of non-complying conditions upon completion of the inspection and any needed repairs have been made.

At railroad facilities where daily locomotive inspections are performed by personnel other than trained mechanical department personnel (i.e., train or switch crew members, etc.), Inspectors should use good judgement and discretion when taking exceptions to some non-complying conditions. Normally railroad employees conducting inspections at these locations are expected to discover easily recognized non-compliance. The FRA inspector should not take exception to technical types of non-compliance, thereby avoiding undue delays at these locations.

The foregoing information is provided as guidance and is not intended to preclude alternative enforcement practices that foster improvement in railroad compliance with Federal regulations. Effective enforcement of the laws a regulations is ultimately dependent upon the creation of an atmosphere in which railroads view compliance, to be in their best interest. If the achievement of that goal requires deviations from these guidelines, Inspectors are encouraged to exercise their discretion.

Violations

Although a railroad need not have knowledge of a non-complying condition on a locomotive to be assessed a civil penalty under the Locomotive Safety Standards, each Inspector is expected to use sound judgement in deciding whether issuance of a violation report is appropriate under the circumstances. The purpose of the civil penalty is to promote compliance, not to punish a railroad for each and every non-complying condition regardless of the circumstances. Accordingly, each Inspector should limit the issuance of violation reports to situations where civil penalties will further enhance this purpose. If a railroad makes a serious, good-faith, effort to comply with the standards, the filing of a violation report for an isolated, difficult to detect non-complying condition would serve no valid enforcement purpose and could actually be counter-productive.

Regulation

The Locomotive Safety Standards will be discussed individually and the suggested method of enforcement indicated.

Part 229 - Railroad Locomotive Safety Standards

Subpart A - General

Sec.

Subpart B - Inspection and Tests

Subpart C - Safety Requirements

General Requirements

Brake System

Draft System

Suspension System

Electrical System

Internal Combustion Equipment

Steam Generators

Cabs and Cab Equipment

Subpart B-Design Requirements

Subpart A - General

§ 229.1 Scope.

This part prescribes minimum Federal safety standards for all locomotives except those propelled by steam power.

§ 229.3 Applicability.

(a) Except as provided in paragraph (b), this part applies to all standard gage railroads.

(b) This part does not apply to:
(1) A railroad that operates only on track inside an installation which is not part of the general railroad system of transportation; or
(2) Rapid transit operations in an urban area that are not connected with the general railroad system of transportation.

Interpretation

Section (b)(1), the Inspector should be aware that if the locomotives of a private industry operates over a portion of a railroads yard or tracks, such locomotives must be in compliance with the Locomotive Safety Standards. No legal action can be taken against the industrial railroad if their locomotives are not in compliance, but the railroad is responsible and liable for those locomotives which it permits to be used on its lines and any legal action must be directed to that railroad. If an industry leases a track in an adjacent railroad yard, it may operate over that track as if it were part of the industrial facility and the locomotives do not come under Federal regulations.

Regulation

§ 229.4 Information collection.

This part relates to information collection under part 229, which was reviewed by the Office of Budget and Management. No enforcement action is attached to this part.

§ 229.5 Definitions.

As used in this part-
(a) *Break* means a fracture resulting in complete separation into parts.

(b) *Cab* means that portion of the superstructure designed to be occupied by the crew operating the locomotive.

(c) *Carrier* means railroad, as the term is defined below.

(d) *Control cab locomotive* means a locomotive without propelling motors but with one or more control stands.

(e) *Crack* means a fracture without separation into parts, except that castings with shrinkage cracks or hot tears that do not significantly diminish the strength of the member are not considered to be cracked.

(f) *Dead locomotive* means-
(1) A locomotive other than a control cab locomotive that does not have any traction device supplying tractive power; or
(2) A control cab locomotive that has a locked and unoccupied cab.

(g) *High voltage* means an electrical potential of more than 150 volts.

(h) *Lite locomotive* means a locomotive or a consist of locomotives not attached to any piece of equipment or attached to only a caboose.

(i) *Locomotive* means a piece of on-track equipment other than hi-rail, specialized maintenance , or other similar equipment-
(1) With one or more propelling motors designed for moving for other equipment;
(2) With one or more propelling motors designed to carry freight or passenger traffic, or both; or
(3) Without propelling motors but with one or more control stands.

(j) *MU locomotive* means a multiple operated electric locomotive described in (i)(2) or (3) of this section.

(k) *Powered axle* is an axle equipped with a traction device.

(l) *Railroad* means all forms of non-highway ground transportation that run on rails or electromagnetic guideways, including (1) commuter or other short-haul rail passenger service in a metropolitan or suburban area , and (2) high speed ground transportation systems that connect metropolitan areas, without regard to whether they use new technologies not associated with traditional railroads. Such term does not include rapid transit operations within an urban area that are not connected to the general railroad system of transportation.

(m) *Serious injury* means an injury that results in the amputation of an appendage, the loss of an eye, the fracture of a bone or confinement in a hospital for a period of more than 24 consecutive hours.

Interpretation

Section (c): The designation carrier should not be used in referring to a railroad. The RSIA 88 did away with the phrase "common carrier" and that the word railroad be inserted in all the FRA regulations which previously used the word carrier or common carrier.

Section (d): This is usually a passenger coach with a control stand located at one end where the operator can operate a passenger train with the locomotive pushing the train from the rear end. Only those portions of the control cab locomotive which have appurtenances and items described in these regulations must be in compliance.

Section (e): A thorough examination of a any part of a locomotive should be made to determine that a crack is indeed a crack and not some other anomaly. The determination of a crack is to be made by the Inspector. If the Inspector requests that a railroad define a crack with its nondestructive test apparatus and it is indeed a crack, it should be written up as a defect and no violation is to be submitted.

Section (f): A dead locomotive may have either an idling or a shut down diesel engine. It can not supply tractive effort.

Section (h): A consist of locomotives is also considered a train in the context of the Power Brakes Regulation, even if the lite locomotives are being moved under their own power.

Section (i): Specialized maintenance or other similar equipment includes track motor cars, cranes, derricks, pile drivers, rail grinders, ballast cleaners, etc. The MP&E inspectors should continue to implement the basic statutory safety requirements to such work equipment by using the Special Notice for Repair when appropriate.

Section (j): This refers, in general, to the self propelled transit cars used in commuter service in various large urban centers around the country. In the common vernacular of the railroad industry, MU locomotive is a generic given to any locomotive which can be coupled in a consist with other locomotives and controlled from a single control cab location.

Section (l): This section is the result of the RSIA 88 passed by an Act of Congress and amended on August 14, 1989.

Section (m): Confinement in a hospital for a period of more than 24 consecutive hours related to that incident.

Regulation

§ 229.7 Prohibited Acts

(a) The Locomotive Inspection Act (45 U. S. C. 23-34) makes it unlawful for any carrier to use or permit to be used on its line any locomotive unless the entire locomotive and its appurtenances-
(1) Are in proper condition and safe to operate in the service to which they are put, without unnecessary peril to life and limb; and
(2) Have been inspected and tested as required by this part.

(b) Any person (including a railroad subject to this part and any manager, supervisor, official, or other employee or agent of such a railroad) who violates any requirement of this part or of the Locomotive Inspection Act or causes the violation of any such requirement is subject to a civil penalty of at least $250 and not more than $10,000 per violation, except that: Penalties may be assessed against individuals only for willful violations, and, where a grossly negligent violation or a pattern of repeated violations has created an imminent hazard of death or injury to persons, or has caused death or injury to persons, a penalty not to exceed $20,000 per violation may be assessed. Each day a violation continues shall constitute a separate offense. See Appendix B of this part for a statement of agency civil penalty policy.

Interpretation

Section (a) This is a general rule and should be used for all items not covered by § 229.45 or any other rule. This rule should be used to report as defective appurtenance such as the warning bell or the alerter equipment. The Inspector should consider filing a violation report under this section if the following is evident:

1. Is the locomotive in proper condition for the service in which it will be put?

2. Does the condition endanger railroad personal and/or the public and expose them to unnecessary peril to life and limb?

3. Has the locomotive and its appurtenances been inspected and tested as required?

Section (b) This amendment that was brought about by the **Rail Safety Improvement**

Act of 1988 (RSIA 88). This section permits the Inspector to use personal liability as an enforcement tool when a railroad employee willfully allows the operation of a locomotive with any non-complying condition described in this Part. Care must be exercised that the act is committed willfully and the individual had knowledge that the defective condition on the locomotive was non-complying.

Defect Codes

229.007	A. 1.	Locomotive not in proper condition and safe to operate.

Regulation

§ 229.9 Movement of non-complying locomotives.

(a) Except as provided for in paragraphs (b) and (c), a locomotive with one or more conditions not in compliance with this part may be moved only as a lite locomotive or a dead locomotive after the carrier has complied with the following:
(1) A qualified person shall determine -
(i) That it is safe to move the locomotive; and
(ii) The maximum speed and other restrictions necessary for safely conducting the movement;
(2)(i) The engineer in charge of the movement of the locomotive shall be notified in writing and inform all other crew members in the cab of the presence of the non-complying locomotive and the maximum speed and other restrictions determined under paragraph (a)(1)(ii) of this section.
(ii) A copy of the tag described in paragraph (a)(3) of this section may be used to provide the notification required by paragraph (a)(2)(i) of this section.
(3) A tag bearing the words "non-complying locomotive" and containing the following information, shall be securely attached to the control stand on each MU or control cab locomotive and to the isolation switch or near the engine start switch on every other type of locomotive-
(i) The locomotive number;
(ii) The name of the inspecting carrier;
(iii) The inspection location and date;
(iv) The nature of each defect;
(v) Movement restrictions, if any;
(vi) The destination; and
(vii) The signature of the person making the determinations required by this paragraph.

(b) A locomotive that develops a non-complying condition en route may continue to

utilize its propelling motors, if the requirements of paragraph (a) are otherwise fully met until the earlier of -
(1) The next calendar day inspection, or
(2) The nearest forward point where repairs necessary to bring it into compliance can be made.

(c) A non-complying locomotive may be moved lite or dead within a yard, at speeds not in excess of 10 miles per hour, without meeting the requirements of paragraph (a) of this section if the movement is solely for the purpose of repair. The carrier is responsible to insure that the movement may be safely made.

(d) A dead locomotive may not continue in use following a calendar day inspection as a controlling locomotive or at the head end of a train or locomotive consist.

(e) A locomotive does not cease to be a locomotive because its propelling motor or motors are inoperative or because its control jumper cables are not connected.

Interpretation

Section (a): Once a FRA non-complying condition is found either by the railroad's inspector or an MP&E Inspector, the railroad may only move it as a lite locomotive or a dead locomotive under whatever conditions the qualified person and the railroad deem suitable for a safe move. The locomotive may be moved to whichever location the railroad chose to have it brought into compliance. If the FRA Inspector believes that the movement of the locomotive under this section by the railroad constitutes an immediately unsafe situation such as a possible derailment, he may then remove it from service by issuing an FRA form F6180.8 describing not only the immediately unsafe condition but also that the movement as proposed by the railroad would create an additional unsafe problem. The MP&E Inspector should never dictate to a railroad the conditions for the movement of any non-complying locomotive. This is the railroads responsibility at all times. Section 229.9 only permits the movement of a non-complying locomotive under this part. Locomotives which develop air brake problems or have damaged or missing safety appliances must be addressed under the Safety Appliance Standards.

Section (b): The development of a non-complying condition enroute does not require the railroad to stop the locomotive and comply with part (a) of this section. The intent of the regulation is to permit the railroads to use a non-complying locomotive for a limited period of time and under specific conditions. The qualified person is designated by the railroad.

Section (c): The exception is based upon the limited move, speed and the safety restrictions imposed.

Section (d): This section restricts the use of a dead locomotive as a controlling locomotive following a calendar day inspection. If a non-complying condition occurs en route which renders the controlling locomotive "dead" as defined in this part, it can continue to control the locomotive consist until the calendar day inspection is completed. The intent of this restriction is to insure that crew members are not permitted or required to occupy the cab of a non-complying locomotive over an extended period of time.

Section (e): This means that a locomotive is a locomotive at all times and must either be in compliance when in service or tagged as required by Section 229.9(a). A locomotive moving under Section 229.9(a) is still subject to a Special Notice for Repairs for conditions which are immediately unsafe and endanger the movement. If an inspector finds an unsafe condition in which he believes the locomotive should not be moved subject to very specific speed and distance requirements, he can only do this by issuing an FRA form F6180.8 and entering upon it those conditions. Keep in mind that those conditions must be based on safety and can be defended if challenged by the railroad. If a locomotive is defected and violations submitted, the railroad has the legal authority to move the affected locomotive under this section.

Defect Codes

229.009	A. 1.	Move non-complying loco. Failure to meet conditions for movement for movement for repairs.

Regulation

§ 229.11 Locomotive identification.

(a) The letter "F" shall be legibly shown on each side of every locomotive near the end which for identification purposes will be known as the front end.

(b) The locomotive number shall be displayed in clearly legible numbers on each side of each locomotive.

Defect Codes

229.011	A. 1.	Letter "F" missing.
	B. 1.	Locomotive number missing.

Federal Railroad Administration

Regulation

§ 229.13 Control of locomotives.

Except when a locomotive is moved in accordance with Section 229.9, whenever two or more locomotives are coupled in remote or multiple control, the propulsion system, the sanders, and the power brake system of each locomotive shall respond to control from the cab of the controlling locomotive. If a dynamic brake or regenerative brake system is in use, that portion of the system in use shall respond to control from the cab of the controlling locomotive.

Interpretation

Remote control locomotives are located somewhere in the train and the control from the engineer's station is through a radio communication system. The number of axles which would produce electric power for dynamic braking is established by each railroad to control lateral forces imposed at the rail. An inspector may find a locomotive consist with dynamic brakes cut-out to comply with the railroad's operating rules. Also, keep in mind at the present time the dynamic brake systems on a locomotive are not specifically addressed in the regulations nor are they considered to be an appurtenance. Exceptions may be taken if the condition of the dynamic brake system creates an unsafe condition.

Defect Codes

229.013	A. 1.	Failure to respond to controlling locomotive.

Regulation

§ 229.14 Non-MU locomotive control cab locomotives.

On each non-MU control cab locomotive, only those components added to a passenger car that enable it to serve as a lead locomotive, control the locomotive actually providing tractive power, and otherwise control the movement of the train, are subject to this part.

Interpretation

Only those components added to a passenger car, such as the controller and air brake control valve, etc., related to controlling a train are subject to this part. A cab control

car shall be considered out-of-use if it otherwise complies with this part and is part of the train but not controlling from the end.

Regulation

§ 229.17 Accident reports.

(a) In the case of an accident due to a failure from any cause of a locomotive or any part or appurtenance of a locomotive, or a person coming in contact with an electrically energized part or appurtenance, that results in serious injury or death of one or more persons, the carrier operating the locomotive shall immediately report the accident by toll free telephone, area code 800-424-8802. The report shall state the nature of the accident, number of persons killed or seriously injured, the place at which it occurred,the location at which the locomotive or affected parts may be inspected by the FRA, and the name, title and phone number of the person making the call. The locomotive or the part or parts affected by the accident shall be preserved intact by the carrier until after the FRA inspection.

(b) Written confirmation of the oral report required by paragraph (a) of this section shall be immediately be mailed to the Federal Railroad Administration, RRS-25, Washington, DC 20590, and contain a detailed description of the accident, including to the extent known, the causes and the number of persons killed and injured. The writter report required by this paragraph is in addition to the reporting requirements of 49 CFR Part 225.

Defect Codes

229.017	A. 1.	Failure to Report Accident.
	A. 2.	Failure to Preserve Defective Locomotive.
	B. 1.	Written Confirmation of Accident Report Not Made to FRA.

Regulation

§ 229.19 Prior waivers.

All waivers of every form and type from any requirement of any or regulation implementing the Locomotive Inspection Act, applicable to one or more locomotives

except those propelled by steam power, shall lapse on August 31, 1980, unless a copy of the grant of waiver is filed prior to that date with the Office of Safety (RRS-23), Federal Railroad Administration , Washington, D. C. 20590.

Defect Codes

229.019	A. 1.	Failure to File Prior Waiver.

Regulation

Subpart B - Inspections and Tests

§ 229.21 Daily Inspection.

(a) Except for MU locomotives, each locomotive in use shall be inspected at least once during each calendar day. A written report of the inspection shall be made containing the name of the carrier; the initials and number of the locomotive; this report, the place, date and time of the inspection; a description of the non-complying condition disclosed by the inspection; and the signature of the employee making the inspection. Except as provided in § 229.9, any conditions that constitute non-compliance with any requirement of this part shall be repaired before the locomotive is used. A notation shall be made on the report indicating the nature of the repairs that have been made. The person making the repairs shall sign the report. The report shall be filed and retained for at least 92 days in the office of the carrier at the terminal at which the locomotive is cared for. A record shall be maintained on each locomotive showing the place, date and time of the previous inspection.

(b) Each MU locomotive in use shall be inspected at least once during each calendar day and a written report of the inspection shall be made. This report may be part of a single master report covering an entire group of MU's. If any non-complying conditions are found, a separate, individual report shall be made containing the name of the carrier; the initials and number of the locomotive; the place, date and time of the inspection; the non-complying conditions found; and the signature of the inspector. Except as provided in § 229.9, any conditions that constitute non-compliance with any requirement of this part shall be repaired before the locomotive is used. A notation shall be made on the report indicating the nature of the repairs that have been made. The person making the repairs shall sign the report. The report shall be filed in the office of the carrier at the place where the inspection is made or at one central location and retained for at least 92 days.

(c) Each carrier shall designate qualified persons to make the inspection required by this section.

Interpretation

A locomotive should not be reported as defective if the only non-complying condition found is that the record maintained in the cab is overdue by a single day. Also, it is incumbent upon the Inspector to ascertain the previous use of the locomotive to determine that it is actually overdue. Where the railroad calendar day reports reveal FRA non-complying conditions entered by the designated Inspector and they have not been repaired prior to the locomotive being continued in service, this condition should be taken as a defect and a violation if the conditions warrant. One of the key elements in the FRA decision to create the present rule is the railroad is required to insure the locomotive is in total compliance with part 229 prior to use after the calendar day inspection has been performed.

Section (a): A calendar day inspection report is required by this section for each locomotive in use or used; however, if the railroad is asked to provide the reports for a specific locomotive, they generally can not do so. In some cases it may be because none were prepared as required by the regulation. In other cases, this is caused by the time frame contained in the regulation which permits a railroad an actual use of almost 48 hours between inspections. Also, a locomotive may complete an assignment prior to the expiration of the calendar day and not be returned to service for several days. Furthermore, keep in mind that if a locomotive is tied up while time still remains on the original date of that calendar day and is not used for several days, it would still be legal to use that locomotive until the subsequent day ends before the required inspection must be performed. This regulation has a number of ambiguities and each Inspector must be aware of them when judging the inspection status of any given locomotive.

Sections (a) and (b): These sections require that the inspection reports be filed and retained at the terminal at which the locomotive is cared for and this may be either where the locomotive is assigned for an extended period of duty such as an isolated yard office, a fuel facility where locomotives are given calendar day inspections or a maintenance facility to which the locomotive is assigned for periodic inspections and to which the reports prepared in the filed are forwarded.

Section (c): This section gives the railroad the sole prerogative to designate qualified persons to perform the required inspections. FRA has not, to this time, set forth qualification standards for the railroads' designated inspector and the Federal and State MP&E Inspector should be aware of this when reviewing a railroads procedure for calendar locomotive inspections.

When a violation is contemplated, the following questions must be answered in the

affirmative:

- Does the overdue inspection create an immediate hazard?
- Were non-complying conditions previously reported by the railroad inspector or designated engineer not repaired?
- Does the railroad have a history of ignoring the requirements of the calendar day inspection regulation?
- Can a violation be documented from railroad records for use of a locomotive overdue the calendar day inspection?

Defect Codes

Inspecting and Testing

229.021	A. 1.	Daily Locomotive Inspection Overdue.
	A. 2.	Failure to Make Written Report of Daily Inspection.
	A. 3.	Daily Inspection Report Not Properly Made Out.
	A. 4.	Defects Not Reported on Daily Inspection.
	A. 5.	Defects Reported and Not Repaired.
	A. 6.	Daily Inspection Report Not Retained for 92 Days.
	A. 7.	Records Inspection of Daily Inspection Reports.
	B. 1.	MU Locomotive Overdue Daily Inspection.
	B. 2.	Failure to Make Written Report of MU Daily Inspection.
	B. 3.	MU Daily Inspection Report Not Properly

Made Out.

B. 4. MU Defects Not Reported on Daily Inspection.

B. 5. MU Defects Reported and Not Repaired.

B. 6. MU Daily Inspection Report Not Retained for 92 Days.

C. 1. Failure to Use Qualified Person to Make Daily Inspection.

Regulation

§ 229.23 Periodic inspection: General.

(a) Each locomotive and steam generator shall be inspected at each periodic inspection to determine whether is complies with this part. Except as provided in § 229.9, all non-complying parts shall be repaired before the locomotive or steam generator is used. Except as provided in § 229.33, the interval between any two periodic inspections may not exceed 92 days. Periodic inspections shall only be made where adequate facilities are available. At each periodic inspection, a locomotive shall be positioned so that a person may safely inspect the entire underneath portion of the locomotive.

(b) The periodic inspection of the steam generator may be postponed indefinitely if the water suction pipe to the water pump and the leads to the main switch (steam generator switch) are disconnected, and the train line shut-off valve is wired closed or a blind gasket applied. However, the steam generator shall be so inspected before it is returned to service.

(c) After April 30, 1980, each new locomotive shall receive an initial periodic inspection before it is used. Except as provided in § 229.33, each locomotive in use on or before April 30, 1980, shall receive an initial periodic inspection within 92 days of the last 30-day inspection performed under the prior rules (49 CFR 230.331 and 230.451). At the initial periodic inspection, the date and place of the last tests performed that are the equivalent of the tests required by §§ 229.27, 229.29 and 229.31 shall be entered on Form FRA F6180.49. These dates shall determine when the tests first become due under §§ 229.27, 229,29 and 229.31. Out of use credit may be carried over from Form F6180.49 and entered on Form FRA F6180.49A.

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(d) Each periodic inspection shall be recorded on Form FRA F6180.49A. The form shall be signed by the person conducting the inspection and certified by that person's supervisor that the work was done. The form shall be displayed under a transparent cover in a conspicuous place in the cab of each locomotive.

(e) At the first periodic inspection in each calendar year the carrier shall remove from each locomotive Form F 6180.49A covering the previous calendar year. If a locomotive does not receive it first periodic inspection in a calendar year before April 2 because it is out of use, the form shall be promptly replaced. The Form F 6180.49A covering the preceding year for each locomotive, in and out of use, shall be signed by the railroad official responsible for the locomotive and filed as required in § 229.23(f). The date and place of the last periodic inspection and the date and place of the last test performed under §§ 229.27, 229.29 and 229.31 shall be transferred to the replacement Form F 6180.49A.

(f) The mechanical officer of each railroad, who is in charge of a locomotive, shall maintain in his office a secondary record of the information reported on Form F 6180.49A under this part. The secondary record shall be retained until Form F 6180.49A has been removed from the locomotive and filed in the office of the mechanical officer in charge of the locomotive. If the Form FRA F 6180.49A removed from the locomotive is not legible, the secondary record shall be retained until the From FRA F 6180.49A for the succeeding year is filed. The Form FRA F 6180.49A removed from a locomotive shall be retained until the Form F 6180.49A for the succeeding year is filed.

Interpretation

Section (a): The 92 day cycle begins on the date shown on the F 6180.49A report; that is, day one is the date and at 11:59 pm of the 92-day the period will expire. Some Class 1 railroads are performing inspections and reporting them on the F 6180.49A report at intervals shorter than 92 days. The FRA takes no exception to this practice but the Inspector should take sufficient time to examine the report to determine that all tests have been performed within the required time periods. " Adequate facilities" is deliberately not spelled out in the regulation. It permits small shortline railroads which do not have a pit the flexibility to arrange a locomotive in some manner so that the person conducting the inspection of the under side of the locomotive is safe. The regulation does not mandate that a pit is required, but it must be possible to inspect the underneath portion of the positioned locomotive safely.

Section (b): This section, for all practical purposes, is obsolete given that all of the passenger trains used by Amtrak and the commuter railroads use head end electric power for heating their trains. There may be some steam generators in use on trains used in

some seasonal tourist operation.

Section (c): This section was only relevant when the Form F 6180.49A came into use.

Section (d): The F 6180.49A form must be signed by the workman performing the inspection and the supervisor in charge of the workman. A signature is required.

The Union Pacific Railroad has gone to a computer generated F 6180.49A form which is replaced at each periodic inspection. This form must also bear the signatures of the personnel involved with the inspection and tests. Further, the Union Pacific has been advised by the FRA that the computer generated form must be retained as the back-up record for its locomotives as required by this section. The computer generated form and the form used at intervals of less than 92 days will require Inspectors to spend more time to determine if the locomotive is in compliance with time elements in §§ 229.23, 229.25 and § 229.27.

If an Inspector finds locomotives without a F 6180.49A form displayed in the locomotive cab, he shall make inquiry of the railroad as to the reason. If the Inspector is satisfied from the railroad back-up records that the periodic inspection and tests were performed and the inspection report was lost or destroyed, he should permit the railroad to prepare an interim report marked "COPY" with the names printed in place to continue the locomotive in service. A properly prepared and signed report must be placed in the locomotive cab as soon as practicable.

Section (f): The back-up record is the F 6180.49A report removed from the locomotive when the first periodic inspection is performed in a new year. At no time should any railroad forward an F 6180.49A report to the Washington, D. C. Office of Safety.

Defect Codes

229.023	A. 1.	Periodic Inspection Not Made to Locomotive Within 92 Days.
	A. 2.	Periodic Inspection Not Made to Steam Generator Within 92 Days.
	A. 3.	Entire bottom side of locomotive cannot be safely inspected during periodic inspection.
	A. 4.	Periodic Inspection Made With No Facilities Available.

	A. 5.	Records Inspection of Periodic Inspection Reports.
	B. 1.	Periodic Inspection Postponed, Steam Generator Not Properly Rendered Inoperative.
229.023	D. 1.	Form F 6180-49A Missing.
	D. 2.	Form F 6180-49A Improperly made out.
	D. 3.	Form F 6180-49A Not Displayed Under Transparent Cover.
	D. 4.	Transparent Cover Missing or Broken.
	E. 1.	Form F 6180-49A Not Removed and Retained by the Railroad By May 1 of Each Year.
	F. 1.	Secondary Form F 6180-49A Missing From Railroad.
	F. 2.	Secondary Form F 6180-49A Not Retained For One Year by the Railroad.

Regulation

§ 229.25 Tests: Every periodic inspection.

Each periodic inspection shall include the following:

(a) All gauges used by the engineer for braking the train or locomotives, except load meters used in conjunction with an auxiliary brake system, shall be tested by comparison with a dead weight tester or a test gauge designed for this purpose.

(b) All electrical devices and visible insulation shall be inspected.

(c) All cable connections between locomotives and jumpers that are designed to carry 600 volts or more shall be thoroughly cleaned, inspected, and tested for continuity.

(d) Each steam generator that is not isolated as prescribed in § 229.23(b) shall be inspected and tested as follows:
(1) All automatic controls, alarms, and protective devices shall be inspected and tested.
(2) Steam pressure gauges shall be tested by comparison with a dead weight tester or a test gauge designed for this purpose. The syphons to the steam gauges shall be removed and their connections examined to determine that they are open.
(3) Safety valves shall be set and tested under steam after the steam pressure gauge is tested.

Interpretation

Section (a): Many railroads use a portable air gauge test device which allows testing without removal of the gauges. The use of such a device is acceptable as long as the gauge is tested throughout its entire range. Included in the gauges used by the engineer is the brake pipe airflow meter and it must be tested at every 92 day periodic inspection.

Section (b): Sufficient inspection covers are to be removed from traction motors, traction generators and electrical cabinets in order to thoroughly inspect such equipment for general safety conditions and safety defects.

Defect Codes

229.025	A. 1.	Gauges Not Inspected At Time of Periodic Inspection.
	B. 1.	Electrical Inspection Not Made At Time of Periodic Inspection.
	B. 2.	Electric Devices Defective At Time of Periodic Inspection.
	B. 3.	Electric Insulation Defective At Time of Periodic Inspection.
	C. 1.	600 Volt Cable Connection or Jumper Cables Not Inspected At Periodic Inspection.
	D. 1.	Steam Generator Automatic Controls, Alarms/Protect Devices Not Inspected/Tested/Defective.

D. 2. Steam Pressure Gauge Not Tested At Time of Periodic Inspection.

D. 3. Safety Valves Not Properly Set and Tested At Periodic Inspection.

Regulation

§ 229.27 Annual tests.

Each locomotive shall be subjected to the tests and inspections included in paragraphs (b) and (c) of this section, and each non-MU locomotive shall also be subjected to the tests and inspections included in paragraph (a) of this section at intervals that do not exceed 368 calendar days:

(a)(1) The filtering devices or dirt collectors located in the main reservoir supply line to the air brake system shall be cleaned, repaired, or replaced.

(2) Brake cylinder relay valve portions, main reservoir safety valves, brake pipe vent valve portions, feed and reducing valve portions in the air brake system (including related dirt collectors and filters) shall be cleaned, repaired and tested.

(3) The date and place of the cleaning, repairing, and testing shall be recorded on Form FRA F 6180.49A and the person performing the work and that persons supervisor shall sign the form. A record of the parts of the air brake system that are cleaned, repaired, and tested shall be kept in the carrier's file or in the cab of the locomotive.

(4) At its option, a carrier may fragment the work required by this paragraph. In that event, a separate air record shall be maintained under transparent cover in the cab. The air record shall include the locomotive number, a list of the air brake components, and the date and place of the last inspection and test of each component. The signature of the person performing the work and the signature of that person's supervisor shall be included for each component. A duplicate record shall be maintained in the carrier's files.

(b) Load meters shall be tested. Errors of less than five percent do not have to be corrected. The date and place of the test shall be recorded on Form FRA F 6180.49A and the person conducting the test and that persons supervisor shall sign the form.

(c) Each steam generator that is not isolated as prescribed in § 229.23(b), shall be

subjected to a hydrostatic test at least 25 percent above the working pressure and the visual return water-flow indicator shall be removed and inspected.

Interpretation

Section (a): The MU locomotives are only required to comply with Sections (b) and (c) if so equipped. When Part 229 was promulgated, MU locomotives were subject to a two-year inspection interval and this was not changed.

Section (a)(4): When this regulation was included, only the Chessie System, presently part of the CSXT, desired a fragmented system of maintaining its air brake equipment on locomotives. They use a card in the cab of the locomotive which lists the various valves and the cleaning dates. The card can be very confusing when the Inspector is attempting to determine if it is in date, and sufficient time must be allocated in order to make this determination.

Section (b): Indicators used as load meters are also required to be tested.

Defect Codes

229.027	A. 1.	Fail to Clean, Repair/Replace Main Air Reservoir Filter/Collect Devices on Annual Test.
	A. 2.	Failure Properly to Clean, Repair, or Replace Air System as Required Annual Test.
	A. 3.	Failure Properly to Clean, Repair or Replace Brake Cylinder Relay Portions.
	A. 4.	Failure Properly to Clean, Repair or Replace Main Air Reservoir Safety Valves.
	A. 5.	Failure Properly to Clean, Repair or Replace Feed and Reducing Valve Portions.
	A. 6.	Failure Properly to Clean, Repair or Replace Related Dirt Collectors and Filters.
	A. 7.	Failure to Perform All Annual Tests Listed in CFR 229.027A2.

	A. 8.	Failure to Record Air Brake Inspection Information on F 6180-49A At Annual Test.
	A. 9.	Failure to Properly Record Air Brake Inspection Information on Air Record.
	B. 1.	Load Meters Not Tested At Annual Test.
	B. 2.	Load Meters In Error in Excess 5% Not Corrected At Annual Test.
	B. 3.	Load Meter Test Data Not on Form F 6180-49A.
	C. 1.	Hydrostatic Test of Steam Generator Not Made Properly At Annual Test.
229.027	C. 2.	Visual Return Water-Flow Indicator Not Removed/Inspected or Is Defective.

Regulation

§ 229.29 Biennial tests.

(a) Except for the valves and valve portions on non-MU locomotives that are cleaned, repaired and tested as prescribed in § 229.27(a), all valves, valve portions, MU locomotive brake cylinders and electro-pneumatic master controllers in the air brake system (including related dirt collectors and filters) shall be cleaned, repaired, and tested at intervals that do not exceed 736 calendar days. The date and place of the cleaning, repairing, and testing shall be recorded on Form FRA F 6180.49A and the person performing the work and that person's supervisor shall sign the form. A record of the parts of the air brake system that are cleaned, repaired, and tested shall be kept in the carrier's file or in the cab of the locomotive.

(b) At its option, a carrier may fragment the work required by this section. In that event, a separate air record shall be maintained under transparent cover in the cab. The air record shall include the locomotive number, a list of the air brake components, and the date and place of the last inspection and test of each component. The signature of the person performing the work and the signature of that person's supervisor shall be included for each component. A duplicate record shall be maintained in the carrier's files.

Interpretation

Section (a): This section refers to all other valves in the air brake system. A waiver was granted in 1985 which allows any locomotive with a 26 L type air brake system to go a total of 1104 days between the required cleaning, repairing, and testing.

Section (b): See section 27(a)(4) above.

Defect Codes

229.029	A. 1.	Failure to Clean/Repair/Test Air System As Required at Biennial Test.
	A. 2.	Failure to Properly Record Air Brake Inspection Information.
	A. 3.	Failure to Properly Record Biennial Air Tests Inspection on FRA Form F 6180-49A.
	A. 4.	Failure to Properly Record Biennial Air Test Inspection on Carriers Maintenance Files.

Regulation

§ 229.31 Main reservoir tests.

(a) Except as provided in paragraph (c) of this section, before it is put in service and at intervals that do not exceed 736 calendar days, each main reservoir other than an aluminum reservoir shall be subjected to a hydrostatic pressure of at least 25 percent more than the maximum pressure fixed by the chief mechanical officer. The test date, place, and pressure shall be recorded on Form F 6180.49A, and the person performing the test and that person's supervisor shall sign the form.

(b) Except as provided in paragraph (c) of this section, each main reservoir other than an aluminum reservoir shall be hammer tested over its entire surface while the reservoir is empty at intervals that do not exceed 736 calendar days. The test date and place shall be recorded on Form F 6180.49A, and the person performing the test and that person's supervisor shall sign the form.

(c) Each welded main reservoir originally constructed to withstand at least five times the maximum working pressure fixed by the chief mechanical officer may be drilled over its entire surface with telltale holes that are three-sixteenths of an inch

in diameter. The holes shall be spaced not more than 12 inches apart, measured both longitudinally and circumferentially, and drilled from the outer surface to an extreme depth determined by the formula displayed in the current 49 CFR Part 229. One row of holes shall be drilled lengthwise of the reservoir on a line intersecting the drain opening. A reservoir so drilled does not have to meet the requirements of paragraph (a) and (b) of this section, except the requirements for a hydrostatic test before it is placed in service. Whenever any such telltale hole shall have penetrated the interior of any reservoir, the reservoir shall be permanently withdrawn from service. A reservoir now in use may be drilled in lieu of the tests provided for by paragraphs (a) and (b) of this section, but it shall receive a hydrostatic test before it is returned to use.

(d) Each aluminum main reservoir before being placed in use and at intervals that do not exceed 736 calendar days thereafter shall be -
(1) Cleaned and given a thorough visual inspection of all internal and external surfaces for evidence of defects or deterioration; and
(2) Subjected to a hydrostatic pressure at least twice the maximum working pressure fixed by the chief mechanical officer, but not less than 250 p.s.i. The test date, place, and pressure shall be recorded on Form F 6180.49A, and the person performing the test and that person's supervisor shall sign the form.

Interpretation

Section (c) The word "Drilled" is to be inserted in the Hammer and Hydro block on the FRA form F 6180.49A. The exterior of the drilled reservoirs are to be examined for their general condition.

Defect Codes

229.031	A. 1.	Main Reservoir Hydrostatic Test Not Made.
	A. 2.	Main Reservoir Hydrostatic Test Improper.
	A. 3.	Main Reservoir Hydrostatic Test Improperly Recorded on FRA Form F 6180-49A.
	B. 1.	Main Reservoir Hammer Test Not Made.
	B. 2.	Main Reservoir Hammer Test Improper.
	B. 3.	Main Reservoir Hammer Test Improperly Recorded on FRA Form F 6180.49A.

C. 1. Main Reservoir Not Drilled.

C. 2. Main Reservoir Improperly Drilled.

C. 3. Main Reservoir Telltale Hole Penetrated.

D. 1. Aluminum Main Reservoir Defective.

Regulation

§ 229.33 Out-of-use credit.

When a locomotive is out of use for 30 or more consecutive days or is out of use when it is due for any test or inspection required by §§ 229.23, 229.25, 229.27, 229.29, and 229.31, an out-of-use notation showing the number of out-of-use days shall be made on an inspection line on the Form FRA F 6180.49A. A supervisory employee of the carrier who is responsible for the locomotive shall attest to the notation. If the locomotive is out of use for one or more periods of at least 30 consecutive days each, the interval prescribed for any test or inspection under this part may be extended by the number of days in each period the locomotive is out of use since the last test or inspection in question. A movement made in accordance with § 229.9 is not a use for the purposes of determining the period of the out-of-use credit.

Interpretation

The out of use credit inserted on a line of the F 6180.49A form accounts for the continuous record of a locomotives use for a calendar year. These random days can not be accumulated nor used to extend the intervals prescribed for any test or inspection under this part. The railroad must adjust the intervals so that the number of days do not exceed the time elements described in §§ 229.25, 229.27, 229.29 and 229.31. The creditable out-of-use of 30 days or more which can be used to extend the intervals must be recorded in block number 11 of the Form F 6180.49A. Once the credit is used, it should be deleted from the form. If a railroad leases a locomotive to a private industry and it is used entirely within the confines of a plant which is not a part of the general railroad system, the locomotive need not comply with Part 229. However, the time period of the lease may not be credited as out-of-use time because the locomotive is being used. When the railroad has a leased locomotive returned, the railroad must bring it into compliance with all of Part 229 before it can be used in general railroad service.

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Defect Codes

229.033	A. 1.	Out-Of-Use Credit Not Valid.
	B. 1.	Out-Of-Use Credit Improperly Recorded.

Regulation

Subpart C - Safety Requirements

General Requirements

§ 229.41 Protection against personal injury.

Fan openings, exposed gears and pinions, exposed moving parts of mechanisms, pipes carrying hot gases and high-voltage equipment, switches, circuit breakers, contactors, relays, grid resistors, and fuses shall be in non-hazardous locations or equipped with guards to prevent personal injury.

Interpretation

The requirements of this section are designed to protect against significant safety hazards. The Inspector should not take as defects those things which would stretch a persons credulity that it would create a personal injury hazard. This would include such things as a guard over a rotating shaft not enclosing 100 percent of it and the exposed area is so minute that the shaft can not be touched, or hot pipes that are so removed that distance becomes its own safety margin. To submit violations, the following questions must be answered in the affirmative:

- Is the condition an immediate hazard?
- Is it an unsafe condition?
- Is the voltage defined as high voltage? (more than 150 Volts)

Defect Codes

229.041	A. 1.	Personal Injury Protection Defective/Not Provided, Fan Openings.
	B. 2.	Personal Injury Protection Defective/Not

Provided, Exposed Gears and Pinions.

C. 3. Personal Injury Protection Defective/Not Provided, Exposed Moving Parts of Machinery.

D. 1. Personal Injury Protection Defective/Not Provided, High Voltage Equipment.

E. 1. Personal Injury Protection Defective/Not Provided, Switches, Crct Bkrs, Cntcts, Etc.

Regulation

§ 229.43 Exhaust and battery gases.

(a) Products of combustion shall be released entirely outside the cab and other compartments. Exhaust stacks shall be of sufficient height or other means provided to prevent entry of products of combustion into the cab or other compartments under usual operating conditions.

(b) Battery containers shall be vented and batteries kept from gassing excessively.

Interpretation

Section (a): The exhaust system of a locomotive should be inspected closely while the diesel engine is running for cracks in the manifolds and expansion bellows, broken or blown out manifold gaskets and other signs of exhaust gas discharge into the engine compartment as evidenced by heavy accumulations of soot and residue. The lay shaft should not be operated by Federal or State Inspectors to accelerate the diesel engine to check for exhaust leaks. If there is evidence of an exhaust leak, the railroad should be requested to operate the throttle to locate it. Instances have been cited by some railroads in which Inspectors have reported exhaust leaks and the railroad inspectors could not find them. Since the advent of the EMD GP-30 and its successors and the GE U-25-B and its successors, the locomotive diesel engine compartments are pressurized to the extent that any residual fumes in the carbody will be scavenged to the atmosphere around the exhaust stack opening in the roof. Also, the seals around the high voltage cabinets located between the operating compartment and the engine compartment are better designed to prevent errant fumes from entering the operating cab. Defects should not be taken if it is of such a minor nature that there is not danger to anyone or anything (e.g., crack in the manifold 1-inch or less). Defects may include cracks in the manifold of greater than 1-inch, but not more than 3-inches. Violations may be submitted if the

following questions can be answered in the affirmative:

- Is the condition an immediate hazard?
- Is it an unsafe condition?
- Can the area be used by anyone?
- Does the railroad habitually ignore exhaust system defects, is the crack in the manifold greater than 3-inches, is a manifold gasket blown, are the manifold bolts loose, etc.?

Defect Codes

Gases Escaping

229.043	A. 1.	Exhaust Stacks Improper Height Causing Gases To Be Improperly Disposed.
	A. 2.	Exhaust Manifold Defective Allowing Gases to Escape.
	A. 3.	Exhaust Gases Entering Cab or Other Compartments.
	B. 1.	Batteries Defective Allowing Gases to Escape.

Regulation

§ 229.45 General condition

All systems and components on a locomotive shall be free of conditions that endanger the safety of the crew, locomotive or train. These conditions include: insecure attachment of components, including third rail beams or shoes, traction motors and motor gear cases; fuel, oil, water, steam, and other leaks and accumulations of oil on electrical equipment that create a personal injury hazard; improper functioning of components, including slack adjusters, pantographs operating cylinders, circuit breakers, contactors, relays, switches, and fuses; and cracks, breaks, excessive wear and other structural infirmities of components including quill drives, axles, gears, pinions, pantographs shoes and horns, third rail beams, traction motor gear cases, and fuel tanks.

Interpretation

This regulation is basically a compendium of many regulations in the former Part 230. The railroads were concerned that the provisions of this regulation created a degree of discretion in interpretation and application by the MP&E Inspectors. FRA stated that this discretion was inherent in the prior regulations and is a necessary element given the variety and complexity of locomotives. FRA position is that Federal and State Inspectors have always interpreted the regulations in Part 230 in a reasonable manner. FRA also believes that, "conditions that endanger the safety of the crew, locomotive, or train" provides the proper and lawful limit to the application of this section.

Conditions described as fuel, oil, water, steam and other leaks are qualified by stating that they must constitute a personal injury hazard. Insecure attachments of those items such as third rail shoes or beams, traction motors and motor gear cases and fuel tanks should have some relevancy to safety, that is, has the condition deteriorated to the point that it is immediately unsafe and could cause an accident. A locomotive should not be cited for conditions described above if they do not constitute a hazard of any type but are merely technically in nature. The railroad should be required to correct the condition and bring the locomotive into compliance.

If one of the four traction motor suspension bearing cap bolts securing the cap to the motor is loose by virtue of a broken and missing lock washer but the securing wire is intact, it should not be cited as a defect, but the railroad should be ordered to correct the condition. The same applies to the gear case on a GE locomotive where three horizontal bolts secure it to the traction motor frame and two small bolts hold the two halves together. One of the upper horizontal bolts missing does not create an immediately unsafe condition. On the other hand, a gear case may be loose on the support arms of an EMD traction motor and the two securing bolts will be tight because the relationship between the opening in the gear case and the thickness of the support arms is greater than 4 inches. This condition creates a problem because the gear case oscillates forcibly on the support arms and a bolt could break and the gear case drop to the track structure.

When a violation is submitted for any of the conditions, described above, the personal injury hazard must be described. Where the condition is dangerous, a violation may be submitted if the following questions are answered in the affirmative:

- Is the condition an immediate hazard?
- Is it an unsafe condition?
- Can the area be used by anyone?

- Can the traction motor gear case fall to the rail?
- Does the loose suspension bearing cap bolt also allow the cap to be loose?

Defect Codes

Defective, Insecure, Improper

229.045	A. 1.	Defective/Insecure Third Rail Shoes or Beams.
	A. 2.	Defective/Insecure Traction Motor and Gear Cases.
	A. 3.	Defective/Insecure Fuel Tanks.
	A. 4.	Defective/Insecure Other.
	B. 1.	Hazardous Leaks Fuel.
	B. 2.	Hazardous Leaks Oil.
	B. 3.	Hazardous Leaks Water.
	B. 4.	Hazardous Leaks Steam.
	B. 5.	Hazardous Leaks-Other.
	C. 1.	Excessive Accumulation of Oil on Electrical Equipment.
	D. 1.	Improper Functioning Slack Adjusters.
	D. 2.	Improper Functioning Pantograph Operating Cylinders.
	D. 3.	Improper Functioning Circuit Breakers.
	D. 4.	Improper Functioning Contactors.
	D. 5.	Improper Functioning Relays.

D. 6.	Improper Functioning Switches.
D. 7.	Improper Functioning Fuses.
D. 8.	Improper Functioning Other.
E. 1.	Quill Drives Cracked/Broken/ Worn, Etc.
E. 2.	Axles Cracked/Broken/Worn, Etc.
E. 3.	Gears Cracked/Broken/Worn, Etc.
E. 4.	Pinions Cracked/Broken/Worn, Etc.
E. 5.	Pantograph Shoes and Horns Cracked/Broken/Worn, Etc.
E. 6.	Third Rail Beams Cracked/Broken/Worn, Etc.
E. 7.	Traction Motor Gear Cases Cracked/Broken/Worn, Etc.
E. 8.	Fuel Oil Tanks Cracked/Broken/Worn, Etc.
E. 9.	Other Cracked/Broken/Worn.
F. 1.	Safety Appliance Bent.
F. 2.	Safety Appliance Broken.

Regulation

Brake System

§ 229.46 Brakes: General

The carrier shall know before each trip that the locomotive brakes and devices for regulating all pressures, including but not limited to the automatic and independent brake valves, operate as intended and that the water and oil have been drained from

the air brake system.

Interpretation

Railroad compliance with this rule is of the utmost importance. The Inspector should observe railroad personnel performing the air brake test on locomotives when assembled in consist.

The most frequently reported non-complying condition for which violations are submitted is failure to drain oil and water from the air brake system. Most of the road locomotives are equipped with some type of automatic, main air reservoir, drain valve to drain the water and oil from the air brake system. Usually when the automatic drain valve is cut out or inoperative, water and oil will accumulate in the reservoir. In this case, Inspectors should not cite a locomotive for an inoperative automatic drain valve, but for failure to drain the reservoir. If the automatic drain valve is found to be inoperative but no water or oil is present in the reservoir, a non-complying condition does not exist. If the condition is found at isolated locations, defects and violations may be submitted if the following questions can be answered in the affirmative:

- Is the condition an immediate hazard?
- Is it an unsafe condition?
- Does railroad personnel, responsible for draining main reservoirs, habitually ignore this requirement?

Defect Codes

Brake System

229.046	A. 1.	Brakes Inoperative.
	B. 1.	Automatic Brake Valve Defective.
	C. 1.	Independent Brake Valve Defective.
	D. 1.	Devices For Regulating Brake Pressure Defective.
	E. 1.	Water and Oil Not Drained From Air Brake System.
	F. 1.	Other Brake Defects.

Regulation

§ 229.47 Emergency brake valve.

(a) Except for locomotives with cabs designed for occupancy by only one person, each road locomotive shall be equipped with a brake pipe valve that is accessible to a member of the crew, other than the engineer, from that crew member's position in the cab. On car body type locomotives, a brake pipe valve shall be attached to the wall adjacent to each end exit door. The words "Emergency Brake Valve" shall be legibly stenciled or marked near each brake pipe valve or shall be shown on an adjacent badge plate.

(b) MU and control cab locomotives operated in road service shall be equipped with an emergency brake valve that is accessible to another crew member in the passenger compartment or vestibule. The words "Emergency Brake Valve" shall be legibly stenciled or marked near each brake pipe valve or shall be shown on an adjacent badge plate.

Interpretation

Section (a): The emergency brake valve may be found in varying locations on different locomotives. There is no precise location except that it must be accessible to some one other than the engineer and be adjacent to exit doors.

Section (b): The emergency brake valve must be located in the passenger compartment and must be connected to the brake pipe.

No exception should be taken if the "Emergency Brake Valve" designation is not intact, but it should be brought to the railroads attention for correction. The Inspector should have the railroad test the emergency valve on locomotives on a random basis to insure proper operation.

Defect Codes

229.047	A. 1.	Emergency Brake Valve Missing on Road Locomotive.
	A. 2.	Emergency Brake Valve Defective on Road Locomotive.
	A. 3.	Emergency Brake Valve Improperly Positioned on Road Locomotive.

A. 4.	Emergency Brake Valve Improperly Stenciled or Marked on Road Locomotive.
B. 1.	Emergency Brake Valve Missing on MU Equipment.
B. 2.	Emergency Brake Valve Defective on MU Equipment.
B. 3.	Emergency Brake Valve Improperly Positioned on MU Equipment.
B. 4.	Emergency Brake Valve Improperly Stenciled or Marked on MU Equipment.

Regulation

§ 229.49 Main reservoir system.

(a)(1) The main reservoir system of each locomotive shall be equipped with at least one safety valve that shall prevent the accumulation of pressure of more than 15 pounds per square inch above the maximum working air pressure fixed by the chief mechanical officer of the carrier operating the locomotive.
(2) Except for non-equipped MU locomotives built prior to January 1, 1981, each locomotive that has a pneumatically actuated system of power controls shall be equipped with a separate reservoir of air under pressure to be used for operating those power controls. The reservoir shall be provided with means to automatically prevent the loss of pressure in the event of a failure of main air pressure, have storage capacity for not less than three operating cycles of control equipment and be located where it is not exposed to damage.

(b) A governor shall be provided that stops and starts or unloads and loads the air compressor within 5 pounds per square inch above or below the maximum air pressure fixed by the carrier.

(c) Each compressor governor used in connection with the automatic air brake system shall be adjusted so that the compressor will start when the main reservoir pressure is not less than 15 pounds per square inch above the maximum brake pipe pressure fixed by the carrier and will not stop the compressor until the reservoir has increased at least 10 pounds.

Interpretation

Section (a)(1):

Only one main air reservoir safety valve is required which shall prevent an accumulation of pressure of more than 15 psi above the maximum pressure set. This means under all operating conditions of the compressor.

Sections (b) and (c): The inspector should have the railroad occasionally demonstrate the functioning and setting of the safety valve and compressor governor.

Defect Codes

Air System

229.049	A. 1.	Main Reservoir Safety Valve Missing.
	A. 2.	Main Reservoir Safety Valve Defective.
	A. 3.	Control Air System Missing or Defective.
	A. 4.	Control Air System Improperly Applied.
	B. 1.	Air Compressor Governor Defective.
	B. 2.	Air Compressor Governor - Other.

Regulation

§ 229.51 Aluminum main reservoirs.

(a) Aluminum main air reservoirs used on locomotives shall be designed as described in 49 CFR Part 229, this section.

Interpretation

Aluminum main air reservoirs are not in use. This section is included in the regulation to provide design guidance.

Federal Railroad Administration

Defect Codes

Aluminum Reservoirs

229.051	A. 1.	Aluminum Main Air Reservoirs Improperly Designed.
	A. 2.	Aluminum Main Reservoirs Defective.

Regulation

§ 229.53 Brake gauges.

All gauges used by the engineer for braking the train or locomotive shall be located so that they may be conveniently read from the engineer's usual position in the cab. An air gauge may not be more than three pounds per square inch in error.

Interpretation

The regulation pertains only to gauges used by the engineer for braking a train or locomotive, any other air gauges located at other locations on a locomotive are not included. The brake gauge accuracy is limited to air gauges only.

Defect Codes

Brake Gauges

229.053	A. 1.	Brake Gauges Improperly Located.
	B. 1.	Brake Gauges Inoperative.
	C. 1.	Brake Gauges Defective.
	D. 1.	Brake Gauges - Other

Regulation

§ 229.55 Piston travel.

(a) Brake cylinder piston travel shall be sufficient to provide brake shoe clearance

when the brakes are released.

(b) When the brakes are applied on a standing locomotive, the brake cylinder piston travel may not exceed 1-1/2 inches less than the total possible piston travel. The total possible piston travel for each locomotive shall be entered on the Form FRA F 6180.49A.

(c) The minimum brake cylinder pressure shall be 30 pounds per square inch.

Interpretation

Section (b): The requirement is that the piston travel shall not exceed 1-1/2" less than the total possible piston travel. On the greatest number of locomotives in service today, the total piston travel for truck mounted brake cylinders is 8", therefore the allowable piston travel shall not exceed 6-1/2 ". Keep in mind that a piston travel of more than 6-1/2" is not unsafe because the locomotive brake utilizes a relay valve which has access to the air in two large reservoirs and the air compressor output. Excessive piston travel of a minor nature and on only one cylinder should not be reported, but the railroad should be ordered to repair it. The length of the piston travel must be considered (e.g., more than 7-inches) before a violation is considered and then the following questions must be answered in the affirmative:

- Is the condition an immediate hazard?
- Is it an unsafe condition?
- Does the railroad habitually ignore brake piston travel requirements?

Defect Codes

Foundation Brakes

229.055	A. 1.	Brake Shoe Will Not Clear Wheel When Released.
	A. 2.	Piston Travel Excessive.
	A. 3.	Brake Cylinder Pressure Improper.

Federal Railroad Administration

Regulation

§ 229.57 Foundation brake gear.

A lever, rod, brake beam, hanger, or pin may not be worn through more than 30 percent of its cross-sectional area, cracked, broken, or missing. All pins shall be secured in place with cotters, split keys, or nuts. Brake shoes shall be fastened with a brake shoe key and aligned in relation to the wheel to prevent localized thermal stress in the edge of the rim or the flange.

Interpretation

The defect and violation usually taken under this regulation is brake shoe misalignment. The brake shoe should be aligned in relation to the wheel to prevent localized thermal stress in the edge of the rim or flange. Where the inspector observes a minor misalignment (less than 1/4 inch overhanging shoe) that is corrected by replacement of a brake shoe and no thermal stress is present, this should not be reported as a defective condition. The thermal stress for which a violation may be submitted are those where the following questions can be answered in the affirmative:

- Is the thermal stress an immediate hazard?
- Is it an unsafe condition?
- Is there any indication of heat checks or discoloration?

Defect Codes

229.057	A. 1.	Foundation Brake Gear Cracked.
	B. 1.	Foundation Brake Gear Broken.
	C. 1.	Foundation Brake Gear Missing.
	D. 1.	Foundation Brake Gear Worn More Than 30 Percent.
	E. 1.	Foundation Brake Gear Insecure.
	F. 1.	Foundation Brake Gear Improperly Applied.

G. 1. Foundation Brake Gear Other/Not Aligned with Brake Shoe.

Regulation

§ 229.59 Leakage.

(a) Leakage from the main air reservoir and related piping may not exceed an average of 3 pounds per square inch per minute for 3 minutes after the pressure has been reduced to 60 percent of the maximum pressure.

(b) Brake pipe leakage may not exceed 5 pounds per square inch per minute.

(c) With a full service application at maximum brake pipe pressure and with communication to the brake cylinder closed, the brakes shall remain applied for at least 5 minutes.

(d) Leakage from control air reservoir, related piping, and pneumatically operated controls may not exceed an average of 3 pounds per square inch per minute for 3 minutes.

Interpretation

Section (a): An air leak from the main air reservoir system can not be considered non-complying unless it is more than that described in this section. If the Inspector believes that the leak is excessive, he/she shall have the railroad perform the required test procedure.

Section (b): Brake pipe leakage is to be tested after an automatic brake pipe reduction of at least 15 psi is made, and in the case of a 26 L brake schedule, the cut-off pilot valve is to be placed in the OUT position.

Section (c): Leakage of air observed at a brake cylinder in itself is not a non-complying condition. A non-complying condition would only be present if the brakes did not remain applied for 5 minutes as a result of the leak. This can only be determined after communication from the automatic brake valve is cut-off at the completion of a full service application. The railroad should perform the required test for the MP&E Inspector.

Section (d): This system will only be found on locomotives which utilize air operated electric power contractors and/or an air operated throttle.

Federal Railroad Administration

Defect Codes

Air Brake System

229.059	A. 1.	Air Brake System Leakage Main Air Reservoir and Related Piping.
	B. 1.	Air Brake System Leakage Brake Pipe.
	C. 1.	Air Brake System Leakage Brake Cylinders.
	D. 1.	Air Brake System Leakage Control Air Reservoir.
	E. 1.	Air Brake System Leakage - Other.

Regulation

Draft System

§ 229.61 Draft system.

(a) A coupler may not have any of the following conditions:
(1) A distance between the guard arm and the knuckle nose of more than 5-1/8 inches on standard type couplers (MCB contour 1904) more than 5-5/16 inches on D & E couplers.
(2) A crack or break in the side wall or pin bearing boss outside the shaded ares shown in Figure 1 or in the pulling face of the knuckle.
(3) A coupler assembly without anti-creep protection.
(4) Free slack in the coupler and drawbar not absorbed by friction devices or draft gears that exceeds one-half inches.
(5) A broken or cracked coupler carrier.
(6) A broken or cracked yoke.
(7) A broken draft gear.

(b) A device shall be provided under the lower end of all drawbar pins and articulated connection pins to prevent the pin from falling out of place in case of breakage.

Interpretation

Coupler heights and safety appliances should be examined for compliance with the Safety Appliance Standards and all deficiencies should be reported under Part 231. The coupler height must be measured on level and straight track. The standard height for locomotive couplers is similar to freight and passenger car: standard gauge railroad center of knuckle shall be a maximum of 34-1/2 inches and a minimum of 31-1/2 inches above the top of the rail.

Section (a)(2): The definition of a crack or break must be applied judiciously used when examining a coupler for such a non-complying condition. If the condition observed is a shrinkage crack or a hot tear that does not significantly diminish the strength of the coupler, it is not considered to be a crack.

Section (a)(3): Most freight hauling locomotives have a top operated lock lifter and so long as there is clearance in the operating loop when the knuckle is closed the anti-creep should be functioning.

Section (a)(4): This pertains to all types of locomotives regardless of the service to which it is put. The lost motion is that which is not absorbed by the draft gear or similar equipment and can usually be determined by pushing and pulling the coupler by exerting manual force. It is not the movement which is derived by straining the draft gear with a locomotive.

Defect Codes

Draft System

229.061	A. 1.	Defective Coupler Inoperative.
	A. 2.	Contour Exceeds 5-1/8" on Standard Coupler.
	A. 3.	Contour Exceeds 5-/16" on D and E Couplers.
	A. 4.	Coupler Cracked.
	A. 5.	Coupler Broken.
	A. 6.	Coupler With No Anti-Creep Protection.

B. 1.	Draft System Slack.
B. 2.	Broken or Cracked Coupler Carrier.
B. 3.	Broken or Cracked Yoke.
B. 4.	Broken Draft Gear.
B. 5.	Draft Gear Pin Retainer Broken/Missing.
B. 6.	Device Under Draw Gear Pin Missing or Broken.
B. 7.	Device Under Articulated-Connection Pin Missing or Broken.

Regulation

SUSPENSION SYSTEM

§ 229.63 Lateral Motion

(a) Except as provided in paragraph (b), the total uncontrolled lateral motion between the hubs of the wheel and boxes, between the boxes and pedestals or both, on any pair of wheels may not exceed 1 inch on non-powered axles and friction bearing axles, or 3/4 inch on all other powered axles.

(b) The total uncontrolled lateral motion may not exceed 1-1/4 inches on the center axle of three-axle trucks.

Interpretation

The "total uncontrolled lateral motion" referred to in this section means the lateral motion provided for in design of the parts, plus any additional lateral motion due to wear. The inspector may have to measure at several points of an axle assembly to calculate the total clearance. Keep in mind that this section deals with four different axle arrangements and two different types of locomotive.

Defect Codes

Axles

229.063	A. 1.	Lateral Motion Non Powered Axles 1" or More.
	A. 2.	Lateral Motion Powered Axle 3/4" or More.
	A. 3.	Lateral Motion MU Locomotives 1" or More.
	A. 4.	Lateral Motion Friction Bearing Axles 1" or More.
	B. 1.	Lateral Motion Center Axles 1-1/4" or More.

§ 229.64 Plain bearings

A plain bearing box shall contain visible free oil and may not be cracked to the extent that it will leak oil.

Interpretation

Only plain bearing boxes are referenced in this section, and then in a very restrictive manner. Any mechanical defect in the friction bearings, as well as any defects found in a roller bearing assembly shall be reported under section 229.45, "general conditions." Obvious hazardous conditions found when inspecting either friction or roller bearings not specifically covered by these regulations can be handled by the use of a Special Notice for Repairs, FRA Form F6180.8.

Defect Codes

Plain Bearings

229.064	A. 1.	Plain Bearings No Oil.
	B. 1.	Plain Bearings Box Cracked.
	C. 1.	Plain Bearings - Other.

Regulation

§ 229.65 Spring rigging.

(a) Protective construction or safety hangers shall be provided to prevent spring

planks, spring seats or bolsters from dropping to the track structure in event of a hanger or spring failure.

(b) **An elliptical spring may not have its top (long) leaf broken or any other three leaves broken, except when that spring is part of a nest of three or more springs and none of the other springs in the nest has its top leaf or any other three leaves broken. An outer coil spring or saddle may not be broken. An equalizer, hanger, bolt, gibe, or pin may not be cracked or broken. A coil spring may not be fully compressed when the locomotive is at rest.**

(c) **A shock absorber may not be broken or leaking clearly formed droplets of oil or other fluids.**

Interpretation

Section (b) This section is restricted in application. Many of the locomotives presently in service using elliptical springs have more than three leaf springs in a nest, and it is the Inspector's responsibility to determine if a single broken leaf spring is non-complying in the context of its application. Also, many locomotives are equipped with rubber/steel laminated pads instead of leaf springs, and where such pads are found to be defective or deteriorated and they create an unsafe condition, they should be reported under Section 229.7, Prohibited acts.

Only the outer coil spring is addressed in this section. All coil springs in a truck assembly are to be inspected and considered, such as those which are used to support the span bolster on the EMD SD series of locomotives, and must be in compliance with this section.

Section (c) **"Clearly formed droplets"** means a **fresh** accumulation of oil (not dirty or dried) which continually and/or slowly forms into beads.

Defect Codes

Spring System

229.065	A. 1.	Safety Hangers Loose.
	A. 2.	Safety Hangers Cracked.
	A. 3.	Safety Hangers Broken.
	A. 4.	Safety Hangers Missing.

B. 1.	Elliptical Spring Defective.
B. 2.	Elliptical Spring Broken.
B. 3.	Elliptical Spring Missing.
B. 4.	Coil Spring Defective.
B. 5.	Coil Spring Broken.
B. 6.	Coil Spring Missing.
B. 7.	Coil Spring Fully Compressed.
B. 8.	Cracked/Broken Equalizer, Hanger, Bolt, Gibe, or Pin.
C. 1.	Shock Absorber Loose.
C. 2.	Shock Absorber Cracked.
C. 3.	Shock Absorber Broken.
C. 4.	Shock Absorber Inoperative.

Regulation

§ 229.67 Trucks.

(a) **The male center plate shall extend into the female center plate at least 3/4 inch. On trucks constructed to transmit tractive effort through the center plate or center pin, the male center plate shall extend into the female center plate at least 1-1/2 inches. Maximum lost motion in a center plate assemblage may not exceed 1/2 inch.**

(b) **Each locomotive shall have a device or securing arrangement to prevent the truck and locomotive body from separating in case of a derailment.**

(c) **A truck may not have a loose tie bar or a cracked or broken center casting, motor suspension lug, equalizer, hanger, gibe or pin. A truck frame may not**

be broken or have a crack in a stress area that may affect its structural integrity.

Defect Codes

Trucks

229.067	A. 1.	Truck Center Plate Lost Motion
	B. 1.	Truck Safety Securement Not Satisfactory
	C. 1.	Truck Components Loose.
	C. 2.	Truck Components Cracked.
	C. 3.	Truck Components Broken.
	C. 4.	Truck Components Missing.

Regulation

§ 229.69 Side bearings

(a) **Friction side bearings with springs designed to carry weight may not have more than 25 percent of the springs in any one nest broken.**

(b) **Friction side bearings may not run in contact unless designed to carry weight. Maximum clearance in side bearings may not exceed one-fourth inch on each side or a total of one-half inch on both sides, except where more than two side bearings are used under the same rigid superstructure. The clearance on one pair of side bearings under the same superstructure shall not exceed one-forth inch on each side or a total of one-half inch on both sides; the other side bearing under the same rigid super structure may have one-half inch clearance on each side for a total of 1 inch on both sides. These clearances apply where the spread of the side bearings is 50 inches or less; where the spread is greater, the side bearing clearance may only be increased proportionately.**

Interpretation

Section (b) Side bearings may not run in contact unless they are designed to carry weight. To determine that there is no clearance between a pair of side bearings which

appear to be in contact at both sides, the Inspector must be able to pass a thin feeler gauge through the entire surface.

There are two measurements allowed on a locomotive which has two trucks under the same superstructure. A total not to exceed 1/2-inch is allowed at the side bearings of one truck and under the same superstructure, a total not to exceed 1-inch is allowed. No exception should be taken if all the side bearing clearance is on one side and there is no apparent problem with the locomotive.

Defect Codes

229.069	A. 1.	Broken Side Bearings Springs.
	B. 1.	Side Bearings in Contact.
	B. 2.	Side Bearings Clearance Excessive.
	B. 3.	Side Bearings Otherwise Defective

Regulation

§ 229.71 Clearance above top of rail.

No part or appliance of a locomotive except the wheels, flexible nonmetallic sand pipe extension tips, and trip cock arms may be less than 2-1/2 inches above top of rail.

Defect Codes

229.071	A. 1.	Clearance Above Top of Rail Less Than 2-1/2 inches.

§ 229.73 Wheel sets.

(a) The variation in the circumferences of wheels on the same axle may not exceed 1/4 inch (two tape sizes) when applied or turned.

(b) The maximum variation in the diameter between any two wheel sets in a three-powered-axle truck may not exceed 3/4 inch, except when shims are used at the journal box springs to compensate for wheel diameter variation, the maximum variation may not exceed 1-1/4 inches. The maximum variation between any two wheel sets on different trucks on a locomotive that

has three-powered-axle trucks may not exceed 1-1/4 inch. The diameter of a wheel set is the average diameter of the wheels on any axle.

(c) **On standard gauge locomotives, the distance between the inside gauge of the flanges on non-wide flange wheels may not be less than 53 inches nor more than 53-1/2 inches. The distance between the inside gauge of the flanges on wide flange wheels may not be less than 53 inches or more than 53-1/2 inches.**

Interpretation

Section (b) This section deals with the problem of mismatched wheels which are identified as (1) wheel slip control, (2) traction motor current unbalance and (3) axle load variations.

(1) The wheel slip control system brings into play either manual sanding by the engineer or automatic sanding triggered as the response to arrest the wheel slip. In either case, sanding may substantially increase the ratio of lateral to vertical forces creating a derailment possibility.

(2) Traction motor current unbalance results in different current levels between the motors in the truck which affects the traction motor operating temperature and the distribution of tractive effort.

(3) The axle load variation caused by different wheel sizes affects the adhesion level demanded at various axle locations since some axles are called upon to accept more or less of the locomotive weight then they would with equal wheel sizes. This affects the tracking characteristics of the locomotive. A lightly loaded leading axle of a truck would have a greater tendency to climb the rail in a curve or at track irregularities, while a heavily loaded axle has the same effect on the track structure as a heavier locomotive.

Defect Codes

229.073	A. 1.	Wheel Sets Circumference Variation Improper.
	B. 1.	Wheel Sets Diameter Over 3/4 inch Variation.
	B. 2.	Wheel Sets Diameter Over 1-1/4 inch Variation.

B. 3. Wheel Sets Otherwise Defective.

C. 1. Wheel Sets Gauge Improper.

D. 1. Wheel Sets Gauge Between Flanges on Same Axle Vary More Than 1/4".

Regulation

§ 229.75 Wheel and tire defects

Wheels and tires may not have any of the following conditions:

(a) A single flat spot that is 2-1/2 inches or more in length, or two adjoining spots that are each two or more inches in length.

(b) A gouge or chip in the flange that is more than 1-1/2 inches in length and 1/2 inch in width.

(c) A broken rim, if the tread, measured from the flange at a point five-eights inch above the tread, is less than 3-3/4 inches.

(d) A shelled out spot 2-1/2 inches or more in length, or two adjoining spots that are each two or more inches in length.

(e) A seam running lengthwise that is within 3-3/4 inches of the flange.

(f) A flange worn to a 7/8 inch thickness or less, gauged at a point 3/8 inch above the tread.

(g) A tread worn hollow 5/16 inch or more on a locomotive in road service or 3/8 inch in switching service.

(h) A flange height of 1-1/2 inches or more measured from tread to top of flange.

(i) Tires less than 1-1/2 inches thick.

(j) Rims less than 1 inch thick on a locomotive in road service or less than 3/4 inch in yard service.

(k) A crack or brake in the flange, tread, rim, plate, or hub.

(l) **A loose wheel or tire.**

(m) **Fusion welding may not be used on tires or steel wheels except for the repair of flat spots and worn flanges on locomotives used exclusively in yard service. A wheel that has been welded wheel for the life of the wheel.**

Interpretation

The wheel regulations pertain to all types of locomotives without exceptions. Great care should be exercised in measuring such things as flat spots and high flanges. The inspector should not include a measurement along with a non-complying condition, for instance - A wheel flange more than 1-1/2 inches high by .005 of an inch. In claims collection, the railroads are quick to ask what is unsafe about the .005 inch that requires a violation rather than being defected. Remember, the FRA provides you with **GO/NO GO** gauges and a wheel is either in compliance or it isn't. In part 230, the wheel rules were prefaced by the words, "Wheels with any of the following defects shall not be continued in service:" However, this language is not included in the current regulation. The inspector must decide if a locomotive with a defective wheel condition deserves a Special Notice for Repairs or a violation.

Section (j) When an inspector encounters a wheel in violation of the minimum road service requirements for rim thickness and still not in violation of the yard service requirements, he/she should consider the type service the locomotive is being used in before any action is taken.

Section (k) A crack in a wheel will require some judgement on the part of the Inspectors, especially those who regularly inspect MU locomotive equipment or locomotives used in commuter service. Those cracks which are found in discolored wheels which extend from the tread outward over the edge of the rim or into the flange should be considered as dangerous to the safety of the wheel and handled for correction with the railroad. Cracks which are observed in the tread area of wheels with tread braking on MU locomotives and locomotive used in commuter service which measure 1/2 inch or less and do not extend over the edge of the rim or into the flange area are not to be reported as cracked wheels. However, if any of these 1/2 inch cracks appear to be opened, it should be reported because the wheel has gone into a state of tension and any further thermal abuse may result in a broken wheel. These cracks are often referred to as thermal checks and result from the relatively high speed, short distance and heavy braking required in commuter service. The Inspector should be aware of any such condition, bring it to the specialists attention for evaluation and monitor it as required. The FRA and the commuter railroads have dealt with these problems on an ongoing basis and the solutions have been a tribute to the agency working with the industry.

Section (m) At the option of the railroad, welding of wheels is permitted to make emergency repairs in order to move a locomotive from an accident site or a location where a defective wheel can not be replaced. However, any subsequent move can then only be made as required by Section 229.9, that is, the locomotive can not be used in service and can only be moved lite or dead-in-tow.

When a violation is submitted for a defective wheel condition the following questions are answered in the affirmative:

1. Is the condition an immediate hazard?

2. Is it an unsafe condition?

3. Does the railroad ignore defective wheel conditions?

Defect Codes

229.075	A. 1.	Wheel Slid Flat Spot 2-1/2" or More in Length.
	A. 2.	Wheel Has 2 Adjoining Flat Spots Each Being 2" or Greater in length.
	A. 3.	Wheel Has a Single Flat Spot 3" or More in Length.
	A. 4.	Wheel Has 2 Adjoining Flat Spots One at Least 2" in long, and Other is 2\1/2" or Longer.
	B. 1.	Wheel has Chip/Gouge in Flange 1-1/2" in Length and 1/2" or More in Width.
	B. 2.	Wheel has Chip/Gouge in Flange 1-5/8" in Length and 5/8" or More in Width.
	B. 3.	Wheel has Chip/Gouge in Flange 1-3/4" in Length and 3/4" or More in Width.
	C. 1.	Wheel has Broken Rim with Tread Less

	Than 3-3/4" Wide.
C. 2.	Wheel has Broken Rim with Tread Less Than 3-1/2" Wide.
D. 1.	Wheel Has Shelled-Out Spots 2-1/2" or More in Length.
D. 2.	Wheel Has 2 Adjoining Shelled-Out Spots 2-1/2" Each 2" or More in Length.
D. 3.	Wheel Has Single Shelled-Out Spots 3" or More in Length.
D. 4.	Wheel Has 2 Adjoining Shelled-Out Spots 2-1/2" One at Least 2" Long Other is 2-1/2" or Longer.
E. 1.	Wheel Has Seem in Tread.
F. 1.	Wheel Flange 7/8" or Less At 3/8" Above the Tread.
F. 2.	Wheel Flange 3/16" or Less At 3/8" Above the Tread.
F. 3.	Wheel Flange 3/4" or Less At 3/8" Above the Tread.
G. 1.	Road Locomotive With Tread Worn Hollow Wheel.
G. 2.	Switching Locomotive With Tread Worn Hollow Wheel.
H. 1.	Flange is 1-1/2" or More From the Tread to Top of Flange.
H. 2.	Flange is 1-5/8" or More From the Tread to Top of Flange.

H. 3.	Flange is Greater Than 1-3/4" From the Tread to Top of Flange.
I. 1.	Tire Less Than 1-1/2" Thick.
J. 1.	Rim Thickness Less Than 1" in Road Service.
J. 2.	Rim Thickness Less Than 15/16" in Road Service.
J. 3.	Rim Thickness Less Than 3/4" in Road Service.
J. 4.	Rim Thickness Less Than 3/4" in Yard Service.
J. 5.	Rim Thickness Less Than 11/16" in Yard Service.
J. 6.	Rim Thickness Less Than 5/8" in Yard Service.
K. 1.	Wheel Flange With Crack or Break.
K. 2.	Wheel Tread With Crack or Break
K. 3.	Wheel Rim With Crack or Break.
K. 4.	Wheel Plate With Crack or Break.
K. 5.	Wheel Hub With Crack or Break.
L. 1.	Loose Wheel or Tire.
M. 1.	Welded Wheel or Tire.
M. 2.	Welded Wheel or tire on Locomotive That is Not Moving For Repairs.
M. 3.	Improperly Welding of Wheel or Tire.

ELECTRICAL SYSTEM

Regulation

§ 229.77 Current collectors.

(a) Pantographs shall be so arranged that they can be operated from the engineer's normal position in the cab. Pantographs that automatically rise when released shall have an automatic locking device to secure them in the down position .

(b) Each pantograph operating on an overhead trolley wire shall have a device for locking and grounding it in the lowest position, that can be applied and released only from a position where the operator has a clear view of the pantograph and roof without mounting the roof.

Interpretation

The pantograph control switches or buttons are usually located on or near the engineer's control panel and should be operated by railroad personnel only.

Inspectors should be alert when inspecting locomotives and MU locomotives in electrified territory. They should consider the catenary system and the current carrying parts of the third rail system to be energized and dangerous at all times. Inspectors should not get on the roof of any equipment when it is under the catenary system. Extreme care should be exercised with the use and handling of metal gauges and tools around electrical equipment and especially third rail equipment.

Defect Codes

229.077	A. 1.	Pantograph Not Operating Properly From Engineer's Position.
	A. 2.	Pantograph Not Locked in Down Position.
	B. 1.	Pantograph Not Grounded or Properly Locked.
	B. 2.	Pantograph Not Where Operator Can See Operation.

§ 229.79 Third rail shoes.

When locomotives are equipped with both third rail shoes and overhead collectors, third rail shoes shall be de-energized while in yards and at stations when current collection is exclusively from the overhead conductor.

Interpretation

Inspectors should be aware that considerable force is exerted on a third-rail shoe beams when in operation. Therefore , these beams must be properly secured on brackets and not split and cracked.

Defect Codes

229.079	A. 1.	Third Rail Shoes Improperly De-energized.
	B. 1.	Overhead Collectors Improperly De-energized.

Regulation

§ 229.81 Emergency pole; shoe insulation.

(a) **Each locomotive equipped with a pantograph operating on an overhead trolley wire shall have an emergency suitable for operating the pantograph. Unless the entire pole can be safely handled, the part of the pole which can be safely handled shall be marked to so indicate. This pole shall be protected from moisture when not in use.**

(b) **Each locomotive equipped with Third-rail shoes shall have a device for insulating the current collecting apparatus from the third rail.**

Defect Codes

229.081	A. 1.	Emergency Pole Missing or Defective.
	A. 2.	Emergency Pole Safe Handling Zone Not Properly Marked.
	A. 3.	Emergency Pole Not Protected From Moisture.

B. 1. Third-Rail Shoe Insulating Device Missing or Defective.

Regulation

§ 229.83 Insulation or grounding of metal parts

All unguarded noncurrent-carrying metal parts subject to becoming charged shall be grounded or thoroughly insulated.

Defect Codes

229.083	A. 1.	Unguarded Noncurrent-Carrying Metal Parts Improperly Grounded or Insulated.

Regulation

§ 229.85 Doors and cover plates marked "Danger".

All doors and cover plates guarding high voltage equipment shall be marked "Danger-High Voltage" or with the word "Danger" and the normal voltage carried by the parts so protected.

Interpretation

This item should only be reported as a defect if there are no markings to indicate an obvious area of high voltage. If the carbody doors into the main generator or alternator generator compartment are marked "Danger-High Voltage" or "Danger" but the generator itself does not have each and every cover directly applied to it so marked, especially if the covers are bolted in place, it should not be reported as a defect. Some logic has to be used by the Inspector to determine if there is any eminent danger versus a technical defect in the absence of a cover not being marked. To submit a violation for lack of danger markings on doors and covers, the following questions must be answered in the affirmative:

1. Is the area being inspected high voltage as defined in Section 229.5(g)?

2. Does the lack of the warning create an immediate hazard?

3. Is the lack of the warning unsafe to any individual?

4. Is the violation technical rather than actual?

Defect Codes

229.085	A. 1.	High-Voltage Equipment Door and Cover Plates Not Properly Marked "Danger".

Regulation

§ 229.87 Hand-operated switches.

All hand operated switches carrying currents with a potential of more than 150 volts that may be operated while under load shall be covered and shall be operative from the outside of the cover. Means shall be provided to show whether the switches are open or closed. Switches that should not be operated while under load shall be legibly marked with the words "must not be operated under load" and the voltage carried.

Defect Codes

229.087	A. 1.	Hand Operated Switches Improperly Covered.
	B. 1.	Hand Operated Switches Improperly Designated.
	C. 1.	Hand Operated Switches Improperly Marked.

Regulation

§ 229.89 Jumper; cable connections.

(a) Jumpers and cable connections between locomotives shall be so located and guarded to provide sufficient vertical clearance. They may not hang with one end free.

(b) Cable and jumper connections between locomotives may not have any of the following conditions:

(1) Broken or badly chafed insulation.

(2) **Broken plugs, receptacles or terminals.**
(3) **Broken or protruding strands of wire.**

Interpretation

Section (a): Control cables with one end hanging loose should not be taken as a noncomplying condition when a locomotive is found standing in a yard and the locomotive is not assigned for service. If the cable end is hanging and does not present an immediate hazard, the railroad should be ordered to correct the condition. To submit a violation for cable defects, the following questions must be answered in the affirmative:

1. Is the condition of the cable an immediate hazard?

2. Is it an unsafe condition?

Defect Codes

229.089	A. 1.	Jumpers or Cables Improperly Located or Guarded.
	B. 1.	Cable Broken or Has Badly Chafed Insulation.
	B. 2.	Broken Plugs, Receptacles or Terminals on Cable or Jumper.
	B. 3.	Broken or Protruding Strands of Wire on Cable or Jumper.

Regulation

§ 229.91 Motors and generators

A motor or a generator may not have any of the following conditions:
(a) Be shorted or grounded.
(b) Throw solder excessively.
(c) Show evidence of coming apart.
(d) Have an overheated support bearing.
(e) Have an excessive accumulation of oil.

Interpretation

The defect most often reported is accumulation of oil. The key word in the regulation is excessive. If the accumulation over the exterior of the motor or generator is not excessive, it should not be reported. Also, if it is an old accumulation as evidenced by debris and dirt, and no fresh oil is found, it should not be reported as a defect. To submit a violation for motor and generator defects, the following questions must be answered in the affirmative:

1. Does the condition of the motor or generator create an immediate hazard?
2. Is the motor or generator in an unsafe condition?
3. Does the oil accumulation present an immediate fire hazard?

Defect Codes

229.091	A. 1.	Motors/Generators Shorted or Grounded.
	B. 1.	Motors/Generators Throwing Solder. Excessively
	C. 1.	Motors/Generators Show Evidence of Coming Apart.
	D. 1.	Motors/Generators Overheated Support Bearing.
	E. 1.	Motors/Generators Have An Accumulation of Oil.

INTERNAL COMBUSTION EQUIPMENT

Regulation

§ 229.93 Safety cut-off device

The fuel line shall have a safety cut-off device that-

(a) Is located adjacent to the supply tank or in another safe location.

(b) Closes automatically when it trips and can be set without hazard; and

(c) Can be hand operated from clearly marked locations, one inside the cab and one on each exterior side of the locomotive.

Interpretation

Since the introduction of the EMD GP-30 series locomotives in the 1950 and the GE U-25 series, the fuel safety cut-out devices have been incorporated in the emergency shut down switches. When the engine is shut down, the lack of auxiliary generator current causes the electric motor driven fuel pump to stop. The earlier fuel safety cut-off devices was a mechanical valve manually operated through a cable system from three locations. Reset of this valve is also manual. The safety cut-off devices of both types must be operable from three locations, one in the cab and one on each exterior side of the locomotive. The Inspector is not to operate the safety cut-off device, but should request a railroad employee to demonstrate its function for him. This item is not to be reported as a defect if the only deficiency is that the required marking is not complete. This should be brought to the railroads attention for correction.

Violations should only be considered it the following questions can be answered in the affirmative:

1. Does the safety cut-off device function as intended?

2. Are the devices in the appropriate locations?

3. If cable operated, will the device operate from all locations and can it be reset without hazard?

Defect Codes

229.093	A. 1.	Fuel Line Safety Cut-Off Device Improperly.
	B. 1.	Fuel Line Safety Cut-Off Device Does Not Close Automatically.
	B. 2.	Fuel Line Safety Cut-Off Device Cannot Be Reset Without Hazard.
	C. 1.	Fuel Line Safety Cut-Off Device Improperly Marked.

	C. 2.	Fuel Line Safety Cut-Off Device Inoperative.

Regulation

§ 229.95 Venting

Fuel tank vent pipes may not discharge on the roof nor on or between the rails.

Defect Codes

229.095	A. 1.	Fuel Tank Vent Pipes Not Properly Venting.

Regulation

§ 229.97 Grounding fuel tanks

Fuel tanks and related piping shall be electrically grounded.

Interpretation

Note that there is no requirement for any type of fuel level gauge at the fuel oil reservoirs. All locomotives have fuel site glasses of some type but they are for the railroads convenience, as is the automatic fuel shut-off equipment.

Defect Codes

229.097	A. 1.	Fuel Tank Not Properly Grounded.

Regulation

§ 229.99 Safety Hangers

Drive shafts shall have safety hangers.

Interpretation

The drive shaft safety hangers described in this section deal with a shaft which, if disconnected, could fall to the track structure and cause a derailment. Drive shafts are

found on locomotives in which the motive power uses a mechanical drive system to power the drive axles; e.g. Budd Company RDC's and the French Turbo trains.

Defect Codes

229.099	A. 1.	Drive Shaft Safety Hanger Missing.
	B. 1.	Drive Shaft Safety Hanger Loose.
	C. 1.	Drive Shaft Safety Hanger Defective.

Regulation

§ 229.101 Engines

(a) **The temperature and pressure alarms, controls and switches of internal combustion engines shall function properly.**

(b) **Whenever an engine has been shut down due to mechanical or other problems, a distinctive warning notice giving reason for the shut-down shall be conspicuously attached near the engine starting control until repairs have been made.**

(c) **Wheel slip/slide protection shall be provided on locomotives with an engine displaying a warning notice whenever required by section 229.115(b).**

Interpretation

Section (a) The Inspector should be alert to safety switches being nullified when inspecting the diesel engine on locomotives. On EMD locomotives, the Inspector should not take as a defect the cover over the strainer box being out of place, but instead should have the item replaced by the railroad. Where actual tampering of the engine protective devices is found, violations should be considered.

Sections (b) and (c) form the basis for an exclusion to the wheel slip rule for a locomotive which has a diesel engine shut down due to mechanical or other problems. 229.115(b) allows a locomotive to be dispatched with an engine shut down and tagged provided the wheel slip/slide alarm would function on each powered axle if the diesel engine were operating normally.

Violations should only be considered it the following questions can be answered in the affirmative:

1. Do the protective devices function as designed?

2. Is there evidence of tampering with the protective devices?

3. Is there a history of the railroad ignoring or bypassing the protective devices?

Defect Codes

229.101	A. 1.	Engine Alarm Gages/Switches/Controls Inoperative.
	A. 2.	Engine Alarm Gages/Switches/Controls Defective.
	A. 3.	Engine Alarm Gages/Switches/Controls Missing.
	B. 1.	Engine Warning Notice Missing/Improperly Made Out.
	C. 1.	Engine Wheel Slip/Slide Improper when Required.

STEAM GENERATORS

Regulations - Steam Generator

§ 229.103 Safe working pressure.

§ 229.105 Steam generator number.

§ 229.107 Pressure gauge.

§ 229.109 Safety valves.

§ 229.111 Water-flow indicators.

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§ 229.113 Warning notice.

Interpretation

The steam generator regulations are not included in their entirety because there are none in service at the present time. The Inspector should refer to the current CFR Part 229 if a steam generator is found in service in his/her district. The **Defect Codes** for this section have been included only as a reference under their broad headings.

Amtrak and commuter railroads use electricity to heat the passenger cars, operate air conditioning units, provide train lighting, and for all other ancillary equipment. The power source is usually a generator installed in the diesel-electric locomotives or an invertor in the electric locomotives which provides 480 volts, 60 cycle, 3 phase AC electric current. The generators are either stand alone engine/generator sets located in the engine compartment or are driven off the main diesel engine drive line through a gear box. This equipment is to be inspected by the FRA Inspectors. It is the railroad's responsibility to maintain the equipment in a safe and suitable condition for service and all deficiencies should be reported under section 229.7.

Defect Codes

229.103	Safe working pressure.
229.105	Steam generator number.
229.107	Pressure gauge.
229.109	Safety valves.
229.111	Water-flow indicators.
229.113	Warning notice.

CABS AND CAB EQUIPMENT

Regulations

§ 229.115 Slip/slide alarms.

(a) Except for MU locomotives, each locomotive in road service shall be equipped with a device that provides an audible or visual alarm in the cab of either

slipping or sliding wheels on powered axles under power. When two or more locomotives are coupled in multiple or remote control, the wheel slip/slide alarm of each locomotive shall be in the cab of the controlling locomotive.

(b) Except as provided in section 229.9, an equipped locomotive may not be dispatched in road service, or continue in road service following a daily inspection, unless the wheel slip/slide protective device of whatever type-

(1) Is functioning for each powered axle under power; and

(2) Would function on each powered axle if it were under power.

(c) Effective January 1, 1981, all new locomotives capable of being used in road service shall be equipped with a device that detects wheel slip/slide for each powered axle when it is under power. The device shall produce an audible alarm or visual alarm in the cab.

Interpretation

Section (a) The wheel slip/slide device must provide either an audible or a visual alarm in the cab; only one is required. In a multiple locomotive consist, the wheel slip/slide which may occur on a trailing locomotive or a remote controlled locomotive must be heard or seen in the cab of the controlling locomotive.

Section (b) The exclusion to this requirement is included in Sections 229.101 (b) and (c).

Section (c) MU locomotives built prior to January 1, 1981 are excluded from this rule. MU locomotives built after this date must be equipped as required by section (a). All MU locomotives which have powered wheels equipped with slip/slide protection must maintain and have such equipment in operating condition.

Defect Codes

229.115	A. 1.	Wheel Slip/Slide Alarm Non-Equipped.
	A. 2.	Wheel Slip/Slide Alarm Inoperative.
	A. 3.	Wheel Slip/Slide Alarm Improper.
	B. 1.	Wheel Slip/Slide Device Non-Equipped.
	B. 2.	Wheel Slip/Slide Device Inoperative.

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B. 3. Wheel Slip/Slide Device Improper.

Regulations

§ 229.117 Speed indicators.

(a) **After December 31, 1980, each locomotive used as a controlling locomotive at speeds in excess of 20 miles per hour shall be equipped with a speed indicator which is-**

(1) **Accurate within +/- 3 miles per hour of actual speed at speeds of 10 to 30 miles per hour and accurate within +/- 5 miles per hour at speed above 30 miles per hour; and**

(2) **Clearly readable from the engineer's normal position under all light conditions.**

(b) **Each speed indicator required shall be tested as soon as possible after departure by means of speed test sections or equivalent procedures.**

Interpretation

Section (a) The Inspector must recognize that this regulation has several qualifiers; (1) the locomotive must be a controlling locomotive, and (2) it must be on a train which will exceed a speed of 20 mph. These two criteria must be met before enforcement procedures can be instituted. If a locomotive is placed in service in a non-controlling position without a speed indicator or an inoperative speed indicator, the locomotive is in compliance with this section. This section applies to MU locomotives and when it was promulgated, the FRA informed the affected commuter lines that they could apply for waivers.

Section (b) If a speed indicator of a controlling locomotive becomes inoperative en route, it may continue in service under the provisions of section 229.9. There is no requirement implied or written in the regulations which requires the railroad to swap the locomotive with one which has an operative speed indicator nor does it require the railroad to reduce the train speed to 20 miles per hour or less. If the Inspector can develop a case in which a railroad dispatched a controlling locomotive with a reported or known defective or inoperative speed indicator, suitable action should be taken.

Violations should be considered if the following can be answered in the affirmative:

(1) Was the locomotive placed in service as a controlling locomotive with an inoperative speed indicator?

(2) Did the railroad ignore a report that a locomotive had a defective speed indicator?

(3) Does the railroad have a history of ignoring the speed indicator regulation?

Defect Codes

229.117	A. 1.	Not Equipped With Speed Indicator as Required for Operation.
	A. 2.	Speed Indicators Inoperative/Otherwise Defective.
	A. 3.	Speed Indicators Not Readable From Engineer's Normal Position.
	B. 1.	Speed Indicator Not Tested After Departure as Required.

Regulations

§ 229.119 Cabs, floors, and passageways.

(a) Cab seats shall be securely mounted and braced. Cab doors shall be equipped with a secure and operable latching device.

(b) Cab windows of the lead locomotive shall provide an undistorted view of the right of way for the crew from their normal position in the cab. (See also, Safety Glazing Standards, 49 CFR Part 223, 44 FR 77348, Dec.31, 1979.)

(c) Floors of cabs, passageways, and compartments shall be free from oil, water, waste or any obstruction that creates a slipping, tripping, or fire hazard. Floors shall be properly treated to provide secure footing.

(d) The cab shall be provided with a proper ventilation and with a heating arrangement that maintains a temperature of at least 50 degrees Fahrenheit 6 inches above the center of each seat in the cab.

(e) **Similar locomotives with open end platforms coupled in multiple control and use in road service shall have a means of safe passage between them; no passageway is required through the nose of carbody locomotives. There shall be a continuous barrier across the full width of the end of a locomotive or a continuous barrier between locomotives.**

(f) **Containers shall be provided for carrying fusees and torpedoes. A single may be used if it has a partition to separate fusees for torpedoes. Torpedoes shall be kept in a closed metal container.**

Interpretation

Section 229.119(a) Cab seats should be reported as defective only when they are not securely mounted and braced. Wall mounted seat bracket guideways should have no openings in them which would allow the seat bracket to inadvertently fall out.

Section (b) Cab window defects can only be reported if they interfere with the crews undistorted view of the right-of-way from their normal position in the cab. This is a performance standard which should be sufficient to require the railroads to properly maintain such things as windshield wipers and defrosters to meet this standard. Defective cab windows for any other reason may either be taken under the glazing regulations, Part 223, or if broken and sharp edges create a personal injury hazard under Section 229.7.

Section (c) Accumulations of oil, water, debris and other items on passageway, walkways, cab control compartment floors, or engine compartment floors should be of such a nature as to present an **immediate hazardous and unsafe condition** for any person who **would use them,** e.g. slipping, tripping, or does not provide secure footing. The regulation does not require that such things as portable ice chests or crews luggage be secured in the cab, but if these things create a personal injury hazard they are to be addressed under this section. The conditions should be reported as defects if they will continue to accumulate and the railroad will not correct them.

Section (e) Continuous barrier missing should not be reported as a defect if the locomotive is not being used and is inspected in a yard facility. It is the Inspector's obligation to have the condition corrected. This section does not cover the safety appliances specifically described in 49 CFR Sections 231.29 and 231.30. Those items such as walkway safety railings and ladder treads affording access to the roof of the locomotive are covered by this section.

Where a violation is being submitted for any of the above conditions, the following

questions should be answered in the affirmative:

1. Is the condition an immediate hazard?
2. Is it an unsafe condition?
3. Can the area be used by anyone?
4. Does the defective cab window obstruct the crew members view of the right-of-way?

Defect Codes

229.119	A. 1.	Cab Seat Missing of Defective.
	A. 2.	Door Latch Missing or Defective.
	B. 1.	Cab Windows Defective.
	C. 1.	Passageways and Compartments, Floors Hazardous.
	D. 1.	Cab Ventilation Improper.
	D. 2.	Cab Temperature Improper.
	E. 1.	Continuous Barrier Missing/Improper.
	F. 1.	Fusee/Torpedo Container Missing/Improper.

Regulations

§ 229.121 Locomotive cab noise.

(a) After August 31, 1980, the permissible exposure to a continuous noise in a locomotive cab shall not exceed an eight hour time-weighted average of 90 dB(A), with a doubling rate of 5 dB(A) as indicated in the table. Continuous noise is any sound with a rise in time of more than 35 mill-seconds to peak intensity and a duration of more than 500 milliseconds to the time when the level is 20 dB below the peak.

(b) When the continuous noise exposure is composed of two or more periods of

noise exposure of different levels, their combined effect shall be considered. Exposure to different levels for various periods of time shall be computed according to the formula shown in this section in the CFR.

(c) **Exposure to continuous noise shall not exceed 115 dB(A).**

(d) **Noise levels shall be made under typical operating conditions using a sound level meter conforming, at a minimum, to the requirements of ANSI SI.4-1971, Type 2, and set to an A-weighted slow response or with an audio dosimeter of equivalent accuracy and precision.**

(e) **In conducting sound level measurements with a sound level meter, the microphone shall be oriented vertically and positioned approximately 15 centimeters from an axis with the crew members's ear. Measurements with an audio dosimeter shall be conducted with manufacturer's procedures as to microphone placement and orientation.**

Interpretation

Section 229.121 (a) and (b) The table and formula have not been included but can be found by referring to this section in Part 229 of the CFR. Training in the use of the current model of the dosimeter is the responsibility of the FRA Industrial Hygienist. The exposure of employees to railroad related noise has been brought to the forefront by the operating railroad unions. This regulation, unlike OSHA, has no criteria for addressing noise pollution through a noise conservation program by the railroads. This matter is still under review by the FRA Office of Safety and Chief Counsel in conjunction with the railroads.

Section (c) Continuous noise level is defined in Section (a) **as any sound with a rise time of more than 35 milliseconds to peak intensity and a duration of more than 500 milliseconds to the time when the level is 20 dB below the peak.**

Section (e) The sound level measurements are to be made under normal operating conditions. When an inspector performs a test on a locomotive, he will not suggest to the engineer or other crew members how the cab environment is to be adjusted.

Defect Codes

229.121	A. 1.	Cab noise level exceeds 87 DB.
	A. 2.	Cab noise level exceeds 90 DB.

A. 3. Cab noise level exceeds 92 DB.

A. 4. Cab noise level exceeds 115 DB.

Regulations

§ 229.123 Pilots, snowplows, end plates.

After January 1, 1981, each lead locomotive shall be equipped with an end plate that extends across both rails, a pilot, or a snowplow. The minimum clearance above the rail of the pilot, snowplow or end plate shall be 3 inches, and the maximum clearance 6 inches.

Interpretation

This section applies to MU locomotives, also. Several railroads have been granted conditional waivers which allow the maximum height to be greater than 6 inches for locomotives used in hump yard service. The measurement should be taken on relatively level track. The Inspector should not defect a locomotive for a discrepancy of the height requirement if it is less than 1/2 inch, that is, it is 2-1/2 inches or more or 6-1/2 inches or less. However, the railroad should be told to adjust the end arrangement so that it is in compliance. If the end arrangement is secured except for several bolts which do not render it unsafe, this condition should not be reported but brought to the railroads attention for correction.

If violations are considered under this section, the following questions should be answered in the affirmative:

1. Is the condition an immediate hazard?
2. Is it an unsafe condition for train handling?
3. Does the railroad habitually ignore the condition of the pilot, snowplows or end plates?

Defect Codes

229.123	A. 1.	Locomotive Not Equipped With Pilot When Required.
	B. 1.	Locomotive Not Equipped With Snowplow

When Required.

C. 1. Locomotive Not Equipped With End Plate When Required.

D. 1. Pilot, Snowplow End Plate Having Less Than 3" or More Than 6" Clearance ATR.

E. 1. Pilot, Snowplow End Plate Insecure.

Regulations

§ 229.125 Headlights.

(a) **Each lead locomotive used in road service shall have a headlight that produces at least 200,000 candela. If a locomotive or a locomotive consist in road service is regularly required to run backward for any portion of its trip other than to pick up a detached portion of its train or make terminal movements it shall also have on its rear a headlight that produces at least 200,000 candela. Each headlight shall be arranged to illuminate a person at least 800 feet ahead and in front of the headlight.**

(b) **Each locomotive or locomotive consist used in yard service shall have two headlights, one located on the front of the locomotive or locomotive consist and one on its rear. Each headlight shall produce at least 60,000 candela and shall be arranger to illuminate a person at least 300 feet ahead and in front of the headlight.**

(c) **Headlights shall be provided with a device to dim the headlight.**

Interpretation

Sections 229.125 (a) and (b) The candela rating established in this section corresponds to the intensity level implicitly required under the prior rules in section 230.231. That rule was a more detailed performance standard which required not only that it illuminate a person 800 feet ahead and in front of the head- light, but that the engineer in the operating compartment possess the usual visual capacity to see in a clear atmosphere a dark object as large as a man of average size standing erect at least 800 feet ahead and in front of the headlight. This section leaves silent what the attitude of the person in front of the headlight must be.

The Inspector should also be aware that the qualifier in this section is that only the lead

locomotive must be equipped with the prescribed headlight. Intermediate locomotives in a consist with inoperative headlights are not to be considered as non-complying. Also, the requirement for rear headlights on road locomotives has certain conditions. The Inspectors should refrain from reporting headlights as inoperative in a light arrangement using two sealed beam headlights when only one is not illuminated. The railroad should be advised of the condition and have it corrected.

To submit a violation for a headlight non-complying condition the following questions must be answered in the affirmative:

1. Was a locomotive dispatched as a lead locomotive with an inoperative headlight?

2. Did the condition create an immediate hazard?

3. Is it an unsafe condition?

4. Does the railroad habitually ignore headlight problems?

Defect Codes

229.125	A. 1.	Road Locomotive Headlights Inoperative.
	A. 2.	Road Locomotive Headlights Missing.
	A. 3.	Road Locomotive Headlights Inadequate.
	B. 1.	Yard Locomotive Headlights Inoperative.
	B. 2.	Yard Locomotive Headlights Missing.
	B. 3.	Road Locomotive Headlights Inadequate.
	C. 1.	Locomotive Headlight Dimmer Device is Non-Functional.

Regulations

§ 229.127 Cab lights:

(a) **Each locomotive shall have cab lights which will provide sufficient illumination for the control instruments, meters, and gauges to enable the**

engine crew to make accurate readings from their normal positions in the cab. These lights shall be located, constructed, and maintained so that light shines only on those parts requiring illumination and does not interfere with the crews vision of the track and signals. Each controlling locomotive shall also have a conveniently located light that can be readily turn on and off by the persons operating the locomotive and that provides sufficient illumination for them to train orders and timetables.

(b) Cab passageways and compartments shall have adequate illumination.

Interpretation

Section 229.127(b) This section is frequently taken as a non-complying condition. The preamble to this rule states that it was intended to be similar to the former rule, 230.233(b), which includes the qualifier that when employees are required to pass from one cab to another, the platform and passageway between shall be illuminated. There are no passageways on the road-switcher type of locomotives; these are found on the carbody type locomotives where people walk inside and illumination is important. Lights that are inside the carbody of a road-switcher type locomotive are not to be considered as compartment lights and shall not be taken as a noncomplying condition. Where the criteria for a passageway exists, illumination must be provided and the lights maintained. The same is true for the walkway platforms between locomotives found on road-switchers.

To submit a violation for any cab light the following questions must be answered in the affirmative:

1. Is the condition an immediate hazard?
2. Is it an unsafe condition?
3. Does the railroad habitually ignore cab lights?

Defect Codes

229.127	A. 1.	Cab lights Inoperative.
	A. 2.	Cab Lights Missing.
	A. 3.	Cab Lights Inadequate.
	A. 4.	Cab Lights Improperly Positioned.

A. 5.	Cab Lights Defective.
B. 1.	Passageways/Compartments Lights Inoperative.
B. 2.	Passageways/Compartments Lights Missing'
B. 3.	Passageways/Compartments Lights Inadequate.

Regulations

§ 229.129 Audible warning device

(a) After August 31, 1980, each lead locomotive shall be provided with an audible warning device that produces a minimum sound level of 96 dB(A) at 100 feet forward of the locomotive in its direction of travel. The device shall be arranged so that it can be conveniently operated from the engineer's normal position in the cab.

(b) Measurements of the sound level shall be made using a sound level meter conforming, at a minimum, to the requirements of ANSI SI.4-1971, Type 2, and set to an A-weighted slow response. While the locomotive is on level tangent track, the microphone shall be positioned 4 feet above the ground at the center line of the track, and shall be oriented with respect to the sound source in accordance with the manufacture's recommendations.

(c) A 4 dB(A) measurement tolerance is allowable for a given measurement.

Interpretation

This section pertains to all locomotives. Again, the Inspector is reminded that the lead locomotive must be provided with the required audible warning device. The regulation does not take into consideration the location and direction of the warning device, but wherever it is physically it must meet the standard as determined by the test criteria. If a locomotive is found to have an inoperative or apparent low sounding warning device and it will be used as a switching locomotive at an outpost point in yard service, the Inspector should use good judgement before declaring that it is in non-compliance, thereby making legally unusable for service until it is brought into compliance.

The locomotive bell does not constitute a warning device under this section. The bell is considered an appurtenance of the locomotive and as such must be maintained in a safe and suitable condition for service. An inoperative bell is to be reported under Section

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229.7.

Defect Codes

229.129	A. 1.	Audible Warning Device Missing.
	A. 2.	Audible Warning Device Inoperative.
	A. 3.	Audible Warning Device Inadequate.

Regulation

§ 229.131 Sanders

Inoperable sanders that deposit sand on each rail in front of the first power operated wheel set in the direction of movement.

Interpretation

The section has two qualifiers in that **MU locomotives are exempt** and that **each locomotive** in a consist shall have operable sanders that deposit sand **in front of the first powered operated wheel set in the direction of movement.** At a fuel facility where the direction of a locomotive or locomotive consist is not known, the Inspector should require the railroad to have all outboard sanders operational prior to departure. On the other hand, a locomotive inspected at the head end of a train, only the sanders in the direction of the train movement must be operational. Locomotives used in yard switching service which normally move in both directions should have the outboard sanders operational. A hole in the sand delivery pipe would not be termed an inoperative sander, but if sand is being discharged at eye level and constitutes a personal injury hazard, it should be reported under 229.7. **Do not defect a locomotive for a single sander being inoperative, but order the railroad to repair it.** Where defective sanders create an unsafe or dangerous condition, violations may be submitted if the following questions can be answered in the affirmative:

1. Is the condition an immediate hazard?

2. Is it an unsafe condition for train handling?

3. Does the railroad habitually ignore sanders?

Defect Codes

229.131	A. 1. Sanders Missing.
	B. 1. Sanders Inoperative.
	C. 1. Sanders Not Lined to Deliver Sand to Rail.
	D. 1. Sanders Create a Personal Injury Hazard.
	E. 1. Sanders Insecure.

Regulation

Subpart D - Design Requirements

229.141 Body structure, MU locomotives.

This subpart is rarely used by the field inspectors. It will not be included in the manual but may be referred to in the current 49 CFR Part 229. Also, the Defect Codes will not be included except as a general heading.

Interpretation

It was originally included in the MU locomotive rules Part 230.400. It specifically refers to MU locomotives which are described in Section 229.5 as a multiple operated electric locomotive designed to carry freight or passengers, or both. In practice, it means electric motor powered self-propelled commuter transit cars. Technically, it does not cover mechanically powered transit cars such as Budd RDC cars. Further, this is the only Federal rule which describes the strength requirements for any type of locomotive. The AAR, in conjunction with the Ad Hoc Locomotive Control Compartment Committee comprised of representatives of the FRA, UTU, BLE and the AAR, developed Locomotive Crashworthiness Requirements Standard S-580 which applies to all locomotives built after August 1, 1990.

Defect Codes

229.141	MU Body Structure

Chapter 9

Rear End Marking Device--Passenger, Commuter and Freight Trains

Introduction

On November 17, 1976, a notice of proposed rule making (NPRM) was published in the Federal Register (41 FR 50701) stating that the Federal Railroad Administration (FRA) was proposing regulations in response to the provisions of the Federal Railroad Safety Authorization Act of 1976 (Pub. L. 94-348, "the Act") concerning highly visible markers on the rear car of all passenger, commuter and freight trains. See 45 U.S.C. 431 (g)(2) and (3).

The rule is designed to prevent rear end collisions due to limited visibility by requiring the use of illuminated, rear car marking devices. The rule (published at 42 FR 2321 (January 11, 1977)) took effect July 1,1978. The provisions of the rule generally apply when trains are operated on a standard gage main track which is part of the general railroad system of transportation.

In response to changes in railroad operations and technology developments, the regulation has been amended to allow:

* The use of photoelectric cells to determine when the rear end marking device must be illuminated.

* The railroads to use other than train crew members to perform inspection of the rear marker.

* An alternative means of providing protection for a non-train crew member while making a rear marker inspection.

On the following pages you will find the regulation and related information needed to perform rear end marker inspections. The actual regulation will be indented and in bold type. The regulations are primarily self explanatory; however, after some sections of the regulation is an interpretation that may be helpful. Finally, the reporting codes you will use for reporting the results of your inspection are listed.

When reporting your rear end marking device inspection or observation results, enter them in the appropriate column of the Form FRA F6180.59, Motive Power and Equipment Inspection Report. This inspection or observation may be entered on the same report of other activities, such as blue signal and equipment inspections. A separate

number or report is not required.

Regulation

Subpart A - General

Sec.

Subpart B - Marking Devices

AUTHORITY: 45 U.S.C. 431 AND 438, as amended; Pub. L. 100-342; and 49 CFR 1.49(m).

[42 FR 2321, Jan. 11, 1977, unless otherwise noted]

Regulation

Subpart A - General

§ 221.1 Scope.

This part prescribes minimum requirements governing highly visible marking devices for the trailing end of the rear car of all passenger, commuter and freight trains. So long as these minimum requirements are met, railroads may adopt additional or more stringent requirements for rear end marking devices.

§ 221.3 Application.

(a) Except as provided in paragraph (b) of this section, this part applies to passenger, commuter and freight trains when operated on a standard gage main track which is part of the general railroad system of transportation.

(b) This part does not apply to:

(1) A railroad that operates only trains consisting of historical or antiquated equipment for excursion, educational, or recreational purposes;

(2) A train that operates only on track inside an installation which is not part of the general railroad system of transportation.

(3) Rapid transit operations in an urban area that are not connected with the general railroad system of transportation.

(4) A railroad that operates only one train at any given time.

[42 FR 2321, Jan.11, 1977, as amended at 53 FR 28600, July 28, 1988]

§ 221.5 Definitions.

As used in this part:

(a) *Train* means a locomotive unit or locomotive units coupled, with or without cars, involved in a railroad operation conducted on a main track. It does not include yard movements.

(b) *Commuter train* means a short haul passenger train operating on a track which is part of the general railroad system of transportation, within a urban, suburban or metropolitan area. It includes a passenger train provided by an instrumentality of a State or political subdivision thereof.

(c) *Locomotive* means a self-propelled unit of equipment designed for moving other equipment in revenue service and includes a self-propelled unit designed to carry freight or passenger traffic or both.

(d) *Main track* means a track, other than an auxiliary track, extending through yards or between stations, upon which trains are operated by timetable or train order or both, or the use of which is governed by a signal system.

(e) *Train order* means mandatory directives issued as authority for the conduct of a railroad operation outside of yard limits.

(f) *Red-orange-amber color range* means those colors defined by chromaticity coordinates, as expressed in terms of the International Commission on Illumination's 1931 Colormetric System, which lie within the spectrum locus and lines defined by the following equations: X+Y=.97 (white boundary)
Y=X-.12 (green boundary)

(g) *Administrator* means the Federal Railroad Administrator, the Deputy Administrator, or the any official of the Federal Railroad Administration to whom the Administrator has delegated his authority under this part.

(h) *Effective intensity* means that intensity of light in candela as defined by the Illuminating Engineering Society's for Calculating the Effective Intensity of Flashing Signal Lights, November, 1964.

(i) *Qualified person* means any person who has the skill to perform the task and has received adequate instruction.

[42 FR 2321, Jan. 11, 1977; 42 FR 3843, Jan. 21, 1977, as amended at 51 FR 25185, July 10, 1986]

Interpretation

The term "yard movements" used in paragraph (a) means a train which is operated exclusively on track within the designated limits of a yard and whose movements are governed by Rule 93. The minimum requirements of "Rule 93" are defined in 49 CFR 218.35.

§ 221.7 Civil penalty.

Any person (including a railroad and any manager, supervisor, official, or other employee or agent of a railroad) who violates any requirement of this part or causes the violation of any such requirement is subject to a civil penalty of at least $250 and not more than $10,000 per violation, except that: Penalties may be assessed against individuals only for willful violations, and, where a grossly negligent violation or a pattern of repeated violations has created an imminent hazard of death or injury, a penalty not to exceed $20,000 per violation may be assessed. Each day a violation continues shall constitute a separate offense. See appendix C to this part for a statement of agency civil penalty policy.

[53 FR 28600, July 28, 1988, as amended at 53 FR 52930, Dec. 29, 1988]

§ 221.9 Waivers.

(a) A railroad may petition the Federal Railroad Administrator for a waiver of compliance with any requirement of this part.

(b) Each petition for a waiver under this section must be filed in the manner and contain the information required by part 211 of this chapter.

(c) If the Administrator finds that a waiver of compliance is in the public interest and is consistent with railroad safety, he may grant the waiver subject to any condition he deems necessary. Notice of each waiver granted, including a statement of the reasons therefor, will be published in the Federal Register.

§ 221.11 State regulation.

Notwithstanding the provisions of this part, a State may continue in force any law, rule, regulation, order, or standard that was in effect on July 8, 1976, relating to lighted marking devices on the rear car of freight trains except to the extent that such law, rule, regulation, order, or standard would cause such cars to be in violation of this part.

Federal Railroad Administration...

Subpart B - Marking Devices

Regulation

§ 221.13 Marking device display.

(a) During the periods prescribed in paragraph (b) of this section, each train to which this part applies that occupies or operates on main track shall (1) be equipped with, (2) display on the trailing end of the rear car of that train, and (3) continuously illuminate or flash a marking device prescribed in this subpart.

(b) Unless equipped with a functional photoelectric cell activation mechanism complying with paragraph (c) of this section, the marking devices prescribed by this subpart shall be illuminated continuously or flash during the period between one hour before sunset and one hour after sunrise, and during all other hours when weather conditions so restrict visibility that the end silhouette of a standard box car cannot be seen from 1/2 mile on tangent track by a person having 20/20 corrected vision.

(c) Marking devices prescribed this part and equipped with a functional photoelectric cell activation mechanism shall illuminate or flash the device continuously when there is less than 1.0 candela per square meter of ambient light.

(d) The centroid of the marking device must be located at a minimum of 48 inches above the top of rail.

[51 FR 25185, July 10, 1986]

Interpretation

A lighted marking device is required during periods of restricted visibility on a train operating on main track even after it enters yard limits.

Additionally, if a train's operation on a main track within designated yard limits extends its operation beyond those yard limits on a main track, the train then becomes involved in a railroad operation and will require a rear end marking device.

Marking device display.

Defect Codes

§ 221.013

A. 1. Marking device not present.

A. 2. Marking device not displayed

A. 3. Marking device not properly illuminated.

A. 4. Marking device too close to rail.

B. 1. Photoelectric cell activation mechanism does not illuminate or flash the device continuously when there is less than 1.0 candela per square meter of ambient light.

Regulation

§ 221.14 Marking devices.

(a) As prescribed in 221.13, passenger, commuter and freight trains shall be equipped with at least one marking device, which has been approved by the Federal Railroad Administrator in accordance with the procedures included in appendix A of this part, and which has the following characteristics:

(1) An intensity of not less than 100 candela nor more than 1000 candela (or an effective intensity of not less than 1000 candela for flashing lights) as measured at the center of the beam width;

(2) A horizontal beam with a minimum arc width of fifteen (15) degrees each side of the vertical center line, and a vertical beam with a minimum arc width of five (5) degrees each side of the horizontal center line as defined in terms of the candela intensity points;

(3) A color defined by the red-orange-amber color range; and

(4) If a flashing light is used, a flash rate of not less than once every 1.3 seconds nor more than once every .7 seconds.

Federal Railroad Administration...

(b) Marking devices used on passenger and commuter trains in compliance with paragraph (a) of this section shall be lighted under the conditions prescribed in 221.13 (b) and (c).

(1) At least one marking device that complies with paragraph (a) of this section; or

(2) At least one illuminated red or amber classification light on the rear of the locomotive, provided it complies with paragraph (a) of this section; or

(3) The rear headlight of the locomotive illuminated on low beam.

[51 FR 25185, July 10, 1986]

Marking devices

Defect Codes

§ 221.014

A. 1. Use of unapproved or noncomplying device.

B. 1. The light intensity is less than 100 candela.

B. 2. The light intensity is more than 1,000 candela.

C. 1. The horizontal arc beam of light is less than 15 degrees.

C. 2. The vertical arc beam of light is less than 5 degrees.

D. 1. The color is not in accordance with red-orange-amber color range.

E. 1. The flash rate of flashing is less than 1.3 seconds.

E. 2. The flash rate of flashing light is more than .7 seconds.

E. 3. The locomotive headlight used as rear end marking device is not on low beam.

<u>Regulation</u>

§ 221.15 Marking device inspection.

(a) Each marking device displayed in compliance with this part shall be examined at each crew change point to assure that the device is in proper operating condition.

(b) This examination shall be accomplished either by visually observing that the device is functioning as required or that the device will function when required by either (1) repositioning the activation switch or (2) covering the photoelectric cell.

(c) This examination shall be conducted either by the train crew or some other qualified person, Provided that, if a non-train crew member performs the examination, that person shall communicate his or her findings to the locomotive engineer of the new train crew.

(d) When equipped with a radio telemetry capability, a marker displayed in accordance with this part may be examined by observing the readout information displayed in the cab of the controlling locomotive demonstrating that the light is functioning as required in lieu of conducting a visual observation.

[51 FR 25185, July 10, 1986]

Interpretation

When a carrier in the past has replaced, repaired a defective marking device at a crew change point, then any future defective rear end marking devices should be replaced or repaired at those points.

Marking device inspection.

Defect Codes

§ 221.015

A. 1. Failure to inspect at crew change.

B. 1. Visual inspection was not conducted.

B. 2. Activation switch was not repositioned.

B. 3. Photoelectric cell was not covered.

C. 1. Other than crew member, but qualified person conducted the inspection,but did not communicate the results to the engineer of the new train crew.

C. 2. Other than train crew member and not qualified person conducted the inspection.

D. 1. The telemetry device malfunctioned and the rear end marking device was not observed to be functioning properly.

Regulation

§ 221.16 Inspection procedure.

(a) Prior to operating the activation switch or covering the photoelectric cell when conducting this test, a non-train crew person shall determine that he is being protected against the unexpected movement of the train either under the procedures established in Part 218 of this chapter or under the provisions of paragraph (b) of this section.

(b) In order to establish the alternative means of protection under this section, (1) the train to be inspected shall be standing on a main track; (2) the inspection task shall be limited to ascertaining that the marker is in proper operating condition; and (3) prior to performing the inspection procedure, the inspector shall personally contact the locomotive engineer or hostler and be advised by that person that they are occupying the cab of the controlling locomotive and that the train is secure against movement until the inspection has been completed.

[51 FR 25185, July 10, 1986]

Inspection procedure

Defect Codes

§ 221.016 A. 1. Failure to obtain protection

B. 1. Improper protection

Regulation

§ 221.17 Movement of defective equipment.

(a) Whenever the marking device prescribed in this part becomes inoperative enroute, the train may be moved to the next forward location where the marking device can be repaired or replaced.

(b) Defective rolling equipment which, because of the nature of the defect, can be placed only at the rear of a train for movement to the next forward location at which repairs can be made need not be equipped with marking devices prescribed in this part.

(c) When a portion of a train has derailed, and a portable marking device is not available, the remainder of the train may be moved to the nearest terminal without being equipped with the marking device prescribed in this part.

Interpretation

Such replacement locations include the first terminal, yard, or station where markers are available, including locations where markers are stored or available for local trains.

Movement of defective equipment

Defect Codes

§ 221.017	A. 1.	Movement of train with inoperative rear end marking device, (occurred enroute) beyond next forward location.
	B. 1.	Train with a defective rear end marker was moved beyond location where the marker could have been repaired or replaced.
	C. 1.	Remainder of a derailed train was moved beyond the nearest terminal without being equipped with a operating rear end marking device when required.

APPENDIX A TO PART 221 - PROCEDURES FOR APPROVAL OF REAR END MARKING DEVICES

As provided in 221.15 of this part, marking devices must be approved by the Administrator, Approval shall be issued in accordance with the following procedures:

(a) Each submission for approval of a marking device consisting of lighted elements only shall contain the following information:

(1) A detailed description of the device including the type, luminance description, size of lens, manufacturer and catalog number, lamp manufacturer, lamp type and model number, and any auxiliary optics used.

(2) A certification, signed by the chief operating officer of the railroad, that —

(i) The device described in the subsection has been tested in accordance with the current "Guidelines for Testing of FRA Rear End Marking Devices," copies of which may be obtained from the Office of Safety, Federal Railroad Administration, 400 Seventh Street SW., Washington, DC 20590;

(ii) The results of the tests performed under paragraph (j) of this subsection demonstrate marking device performance in compliance with standard prescribed in 49 CFR 221.15;

(iii) Detailed test records, including as a minimum the name and address of the testing organizations, the name of the individual in charge of the tests, a narrative description of the test procedures, the number of samples tested, and for each samples tested, and for each sample tested, the on-axis beam candela, the beam candela at the plus (+), minus (-) 15 degree points in the horizontal plane, the beam candela at the plus (+), minus (-) 5 degree points in the vertical plane, and the chromaticity coordinates, are maintained by the railroad and are available for inspection by the FRA at a designated location which is identified in the submission;

(iv) Marking devices of this type installed in the operating environment shall consist of the same type and model of components as were used in the samples tested for purposes of this approval submission.

(3) Unless otherwise qualified, acknowledgement of the receipt of the submission required by this section shall constitute approval of the device. The FRA reserves

the right to review the test records maintained by the railroad, or to test independently any device submitted for approval under these procedures, and to withdraw the approval of such device at any time, after notice and opportunity for oral comment, if its performance in the operating environment fails to substantiate the test results or to comply with 49 CFR 221.15.

(b)(1) Each submission for approval of a marking device consisting of non-lighted elements or a combination of lighted and non-lighted elements shall contain the following information:

(i) A detailed description of the device including the type of material, the reflectance factor, the size of the device, and the manufacturer and catalogue number;

(ii) A detailed description of the external light source including the intensity through-out its angle of coverage, and the manufacturer and catalogue number;

(iii) A detailed description of the proposed test procedure to be used to demonstrate marking device compliance with the standard prescribed in 49 CFR 221.15, including any detailed mathematical data reflecting any expected performance.

(2) FRA will review the data submitted under subsection (1) of this section , and in those instances in which compliance with 49 CFR 221.15 appears possible from a theoretical analysis, the FRA will authorize and may take part in testing to demonstrate such compliance.

(3) Where authorized testing has demonstrated compliance with 49 CFR 221.15, a railroad shall submit a certification, signed by the chief operating officer of the railroad, that - _

(i) The device described in the original submission has been tested in accordance with the procedures described therein;

(ii) The results of the tests performed under paragraph (i) of this subsection demonstrate marking device performance in compliance with the standard prescribed in 49 CFR 215.15;

(iii) Detailed test records, including as a minimum the name and address of the testing organization, the name of the individual in charge of the tests, a narrative description of the test procedure, a description of the external light source used, the number of samples tested, and for each sample tested , the on-axis beam candela, the beam candela at the plus(+) minus (-) 15 degree points in the horizontal plane,

and the chromaticity coordinates, are maintained by the railroad and are available for inspection by the FRA at a designated location which is identified in the submission;

(iv) Marking devices of this type installed in the operating environment and the external light source used to illuminate them shall consist of the same type and model of components as were used in the samples tested for purposes of this approval submission;

(4) Unless otherwise qualified, acknowledgement of the receipt of the submission required by this subsection shall constitute approval of the device. The FRA reserves the right to review the test records maintained by the railroad, or to test independently any device submitted for approval under these procedures, and to disapprove the use of such device at any time if its performance fails to comply with 49 CFR 215.15.

(c) Whenever a railroad elects to use a marking device which has been previously approved by the FRA, and is included in the current list in Appendix B to this part, the submission shall contain the following information:

(1) The marking device model designation as it appears in Appendix B.

(2) A certification, signed by the chief operating officer of the railroad that-

(i) Marking devices of this type installed in the operating environment shall consist of the same type and model of components as were used in the samples tested for the original approval.

(d) Each submission for approval of a marking device shall be filed in triplicate with the Office of Standards and Procedures, Office of Safety, Federal Railroad Administration, 400 Seventh Street, Washington, DC 20590.

[42 FR 62004, Dec. 8, 1977]

APPENDIX B TO PART 221— APPROVED REAR END MARKING DEVICES

PART 1 -- APPROVED DEVICES TESTED FOR OR BY MANUFACTURERS

1. Manufacturer: Star Headlight & Lantern Co., 168 West Main Street, Honeoye Falls, NY 14472.

FRA identification Nos. FRA-PLE-STAR 845-F (flasher) and FRA-PLE-STAR-845-C (steady burn).

2. Manufacturer: Julian A. McDermott Corp., 1639 Stephen Street, Ridgewood, Long Island, NY 11227.
FRA identification Nos. FRA-MEC-MCD-100-C (steady burn), FRA-MEC-MCD-100-F (flasher), FRA-MEC-MCD-300-C (steady burn) and FRA-MEC-MCD-300-F (flasher).

3. Manufacturer: American Electronics Inc., 40 Essex Street, Hackensack, NJ 07601
FRA identification Nos. FRA-DRGW-YANK-300 (portable strobe), FRA-WP-YANK-301R (flashing), FRA-WP-YANK-305R (flashing), and FRA-WP-YANK-306R (steady burn).

PART II --- APPROVED DEVICES TESTED FOR OR BY RAIL CARRIERS

1. Carrier: Atchison Topeka & Santa Fe Railway Co., Technical Research & Development Department, 1001 Northeast Atchison Street, Topeka, Kans. 66616.
Manufacturer: Trans-Lite, Inc., P.O. Box 70, Milford, Conn. 06460.
FRA identification Nos. FRA-ATSF-TL-875-150, FRA-ATSF-875-60, FRA-ATSF-TL-875-4412, and FRA-ATSF-TL-200.

2. Carrier: Amtrak--National Railroad Passenger Corporation, 400 North Capitol Street NW., Washington, DC 20001
Manufacturer: (a) Trans-Lite, Inc., P.O. Box 70, Milford, Conn. 06460.
FRA identification Nos. FRA-ATK-TL-3895-1, FRA-ATK-TL-4491-2, FRA-ATK-TL-4491-3, and FRA-=ATK-TL-FM-4491-1.

1 NOTE: Yankee Metal Products Corp. previously produced these devices.

Manufacturer: (b) Luminator Division of Gulfton Industries, Inc., 1200 East Dallas North Parkway,
Plano, Tex. 75074.
FRA identification No. FRA-ATK-LUM-0101890-001.
Manufacturer: (c) Whelen Engineering Co., Inc.,
Deep River, Conn. 06417.
FRA identification No. FRA-ATK-WHE-WERT-12.

[43 FR 36447, Aug. 17, 1978]

SUMMARY OF DEFECT REPORTING CODES

Marking devices

Defect Codes

§ 221.013

A. 1. Marking device not present.

A. 2. Marking device not displayed.

A. 3. Marking device not properly illuminated.

A. 4. Marking device too close to rail.

B. 1. Photoelectric cell activation mechanism does not illuminate or flash the device continuously when there is less than 1.0 candela per square meter of ambient light.

Marking devices

§ 221.014

A. 1. Use of unapproved or noncomplying device.

B. 1. The light intensity is less than 100 candela.

B. 2. The light intensity is more than 1,000 candela.

C. 1. The horizontal arc beam of light is less than 15 degrees.

C. 2. The vertical arc beam of light is less than 5 degrees.

D. 1. The color is not in accordance with red-orange-amber color range.

E. 1. The flash rate of flashing is less than 1.3 seconds.

E. 2. The flash rate of flashing light is more than .7 seconds.

E. 3. The locomotive headlight used as rear end marking device is not on low beam.

Marking device inspection.

Defect Codes

§ 221.015

A. 1. Failure to inspect at crew change.

B. 1. Visual inspection was not conducted.

B. 2. Activation switch was not repositioned.

B. 3. Photoelectric cell was not covered.

C. 1. Other than crew member, but qualified person conducted the inspection,but did not communicate results to the engineer of the new train crew.

C. 2. Other than train crew member and not qualified person conducted the inspection.

D. 1. The telemetry device malfunctioned and the rear end marking device was not observed to be functioning properly.

Inspection Procedure

221.016

A. 1. Failure to obtain protection.

B. 1. Improper protection.

Movement of defective equipment

§ 221.017

A. 1. Movement of train with inoperative rear end marking device, (occurred enroute) beyond next forward location.

B. 1. Train with a defective rear end marker was moved beyond location where the marker could have been repaired or replaced.

C. 1. Remainder of a derailed train was moved beyond the nearest terminal without being equipped with a operating rear end marking device when required.

APPENDIX C TO PART 221 -- SCHEDULE OF CIVIL PENALTIES[1]

Section	Violation	Willful Violation
221.13 Marking device display:		
(a) device not present, not displayed, or not properly illuminated.....	$5,000	$7,500
(d) device to close to rail.....	1,000	2,000
221.14 Marking devices:		
Use of unapproved or noncomplying device.....	2,500	5,000
221.15 Marking device inspection:		
(a) Failure to inspect at crew change point.....	2,500	5,000
(b), (c) improper inspection.....	2,500	5,000

1 A penalty may be assessed against an individual only for a willful violation. The Administrator reserves the right to assess a penalty of up to $20,000 for any violation where circumstances warrant. See 49 CFR Part 209, Appendix A. Where the conditions for movement of defective equipment set forth in 221.17 of this part are not met, the movement constitutes a violation of 221.13 of this part.

[53 FR 52930, Dec. 29, 1988]

APPENDIX C TO PART 221 -- SCHEDULE OF CIVIL PENALTIES[1]

Section	Violation	Willful Violation
221.16 Inspection procedure:		
(a)Failure to obtain protection.....	5,000	7,500
(b) Improper protection.....	2,500	5,000
221.17 Movement of defective equipment:	(1)	(1)

CHAPTER 10

STEAM LOCOMOTIVES PART 230

Introduction

The first Federal statue addressing steam locomotives was the Ash Pan Act passed by Congress on May 30, 1908. The act described how the ash pans were to be attached to the steam boiler, that they were to be maintained in a safe suitable condition for service, and that all operating mechanisms of the ash pans shall be so arranged so that they may be safely operated. Prior to the Act, a person had to empty the ash pan by crawling under the locomotive, and if the locomotive moved he was either killed or injured. The Ash Pan Act was repealed by Congress as part of the, "Federal Railroad Safety Authorization Act of 1982" but ash pans are still under Federal regulations and referenced in Part 230, Rule 105, of the **Rules and Instructions for Inspection and Testing of Locomotive Boilers and Their Appurtenances.**

On February 17, 1911, Congress passed the Locomotive Inspection Act, bringing all locomotive steam boilers under Federal auspices and laying out the structure of the Bureau of Locomotive Inspection with its attendant administrative and field force personnel of 50 Locomotive Inspectors and their specific duties. The Bureau was made a part of the Interstate Commerce Commission. The Act held the district inspector responsible for the locomotives housed in his district. On March 4, 1915, the Act was amended to include not only the steam boiler but the entire locomotive and its appurtenances. The steam locomotive regulations are codified under 49 CFR Part 230 Sections 1 to 199.

The regulations pertaining to steam locomotives were last published in 49 CFR Part 230, in 1978. The complete regulations and the interpretations are included in this chapter as ready reference. The defect codes for reporting steam locomotives are also included for preparation of Form FRA F6180.59A, inspection report for entry in the data bank. There are approximately 100 active steam locomotives operating in the United States. Most of them are under the jurisdiction of the FRA. The monitoring of the steam locomotives is the responsibility of the district inspector and all records are maintained at the Regional office. Each railroad and owner of a steam locomotive which falls under these Federal regulations should forward all required reports to the Regional office in which the steam locomotive is housed. The Washington office retains some backup files, but is not complete.

The FRA recognizes that many MP&E inspectors have had little or no exposure to steam locomotives. Training has been provided to all the MP&E specialists and a number of MP&E inspectors. A training video has been prepared relative to the inspection of a steam locomotive

and is available from the regional office. **An inspection of a steam locomotive for an extension of time for the removal of the flues must be conducted by an inspector who has received training on how the inspection is to be performed.**

An inspector who has not been trained in this function should accompany a trained inspector or Regional Specialist so as to gain such knowledge and experience. An inspector must have knowledge of all the steam locomotives operating in his area and he/she must advise the Regional Specialist of the type and location of non-operating as well as operating steam locomotives within his district. He/she should also contact the Regional Specialist when the status of a steam locomotive is unknown. It shall be the responsibility of the Regional Specialist to compile and maintain a current list of the operating steam locomotives as well as the non-operating steam locomotives which could be refurbished and made operative in each region. The list shall contain the name of the railroad, type of operation (seasonal, tourist, dinner train, public relations), the number and initials of the locomotive, the type of steam locomotive (Pacific, Consolidated, Mallet,), configuration (i.e., 2-4-0, saddle tank, compound steam engines), status of the locomotive (operating or non-operating), and the average miles accumulated per year.
* note: see suggested "Steam locomotive Inventory Form"

In regards to the actual boiler inspection, asbestos may be observed at certain points of a steam locomotive used as insulation to prevent thermal loss. As long as the asbestos is not friable, that is, loose and flaking with fibers floating in the air which could be inhaled into the lungs, and/or is completely shielded to prevent contact, it is not considered to be hazardous. If the asbestos is friable, loose, and flaking, the inspector need not expose himself/herself to any danger but inform the railroad or owner of the locomotive that the asbestos must be properly removed or completely sealed and isolated from contact before the requested inspection can be performed. Asbestos fibers are known to be carcinogenic and carried into the lungs can cause cancer or asbestoses.

A steam locomotive is an external combustion engine in which burning fuel converts water into high pressure steam in a horizontal boiler. The steam is directed into that portion of the locomotive called a steam engine where the expansion properties of the steam is allowed to act on both sides of a driver piston to rotate the driving wheels. Most of the steam locomotives in service today have two steam engines, but several railroads have locomotives which have four steam engines. The piston is connected to the drive wheels through a cross head arrangement, main rods and side rods. Control of the speed of the locomotive is accomplished through the throttle mechanism as manipulated by the engineer in the cab. When steam locomotives were the predominant form of tractive power there were approximately 75,000 in service. The steam locomotive was a labor intensive piece of machinery requiring constant attention and hard work to maintain them in a safe and suitable condition for service.

The most critical area of the steam locomotive is the boiler. Keep in mind that 1 cubic inch of water is converted to 1,600 cubic inches of steam, and at a pressure of 150 psi the temperature of saturated steam is 366 degrees. This pressure is attempting to rupture the boiler

and it is the design, maintenance and inspection required by FRA regulations and good maintenance practices by the owners of steam locomotives which prevents this from occurring. When steam boilers do rupture, it is of a cataclysmic nature which can move the mass of the boiler off the rail, and in many cases kills the engineer and fireman. These facts are presented so that you are aware that the steam boiler is a pressure vessel which can be extremely dangerous if not properly inspected and maintained.

PART 230 - LOCOMOTIVE INSPECTION

All of **Part 230** are included in this chapter as well as the defect codes. Also included are the **INTERPRETATIONS, RULINGS, AND INSPECTIONS** which were issued after the original rules were promulgated by the ICC and will be highlighted as **Interpretations** in the text to differentiate them from additional comments highlighted as **Note.** The interpretations and defect codes will follow each regulation and will also each be assembled in a compendium form after the regulations for easy reference.

Regulation:

Section 230 Definition of a locomotive.

> **A locomotive is a self-propelled unit of equipment designed for moving other equipment and includes a self-propelled unit designed to carry freight and/or passenger traffic.**

Subpart A-Boilers and Appurtenances

Regulation:

Section 230.1 Responsibility for the general construction and safe working pressure.

> **The railroad company will be held responsible for the general design and construction of the locomotive boilers under its control. The safe working pressure for each locomotive boiler shall be fixed by the chief mechanical officer of the company or by a competent mechanical engineer under his supervision after full consideration has been given to the general design, workmanship, age, and condition of the boiler, and shall be determined from the minimum thickness of the shell plates, the lowest tensile strength of the plates, the efficiency of the longitudinal joint, the inside diameter of the course, and the lowest factor of safety allowed.**

Defect Codes

230.001 Responsibility for the general construction and safe working pressure.

Regulation:

Section 230.2 Lowest factor.

The lowest factor of safety for locomotive boilers shall be 4.

Note: All steam boilers in service must be designed and built to have a safety factor of at least 4; that is, it must be able to withstand a pressure of at least 4-times the normal working steam pressure.

Defect Codes:

230.002 Lowest factor of safety.

Regulation:

§230.3 Maximum allowable stress on stays and braces.

(a) For locomotives constructed after January 1, 1915, the maximum allowable stress per square inch of net cross sectional area on fire box and combustion chamber stays shall be 7,500 pounds. The maximum allowable stress per square inch of net cross sectional area on round, rectangular, or gusset braces shall be 9,000 pounds.

(b) For locomotives constructed prior to January 1, 1915, the maximum allowable stress on stays and braces shall meet the requirements of §230.2 except that when a new fire box and wrapper sheet are applied to such locomotives they shall be made to meet the requirements of this section.

STRENGTH OF MATERIAL

§230.4 Tensile strength of shell plates.

When the tensile strength of steel or wrought-iron shell plates is not known, it shall be taken at 50,000 pounds for steel and 45,000 pounds for wrought iron.

Defect Codes

230.004 Tensile strength of shell plates

§230.5 Maximum shearing strength of rivets.

The maximum shearing strength of rivet per square inch of cross sectional areas shall be taken as follows:

	Pounds
Iron rivets in single shear.....	**38,000**
Iron rivets in double shear.....	**76,000**
Steel rivets in single shear.....	**44,000**
Steel rivets in double shear.....	**88,000**

Defect Code

230.005 Maximum shearing strength of rivets

§230.6 Higher shearing strength of rivets.

A higher shearing strength may be used for rivets when it can be shown by test that the rivet material used is of such quality as to justify a higher allowable shearing strength.

Defect Code

230.006 Higher shearing strength of rivets.

Regulation:

Section 230.7 Responsibility for inspection and repair.

The mechanical officer in charge at each point where boiler is done will be held responsible for the inspection and repair of all boilers and their appurtenances under his jurisdiction. He must know that all defects disclosed by any inspection are properly repaired before the locomotive is returned to service.

Interpretation:

Rule 7. Rules for inspection.-"Officer in charge" means the officer in direct charge where inspections and repairs are made.

Note: This section requires that the mechanical officer in charge where boiler work is being done will be held responsible for the inspection and repair of all locomotive boilers and their appurtenances under his jurisdiction. He must know that all defects disclosed by any inspection are properly repaired before the locomotive is returned to service. It is evident from the foregoing that heavy emphasis is placed upon the railroad or owner of a steam locomotive for its reliability.

Defect Codes

230.007 Responsibility for inspection and repair

Regulation:

Section 230.8 Term "Inspector."

The term "inspector" as used in the rules and instructions in this subpart, unless otherwise specified, will be held to mean the railroad company's inspector.

Defect Codes

230.008 Term "inspector."

230.10 Flues to be removed.

All flues of locomotive boilers in service, except as otherwise provided, shall be removed at least once every four years for the purpose of making a thorough examination of the interior of the boiler and its bracing. After the flues are taken out, the inside of the boiler must have the scale removed and be thoroughly cleaned and inspected. The removal of flues will be due after 48 calendar months' service provided such service is performed within 5 consecutive years. Portions of calendar months out of service will not be counted. Time of service must be properly accounted for by out of service reports and notations of months claimed out of service made on the back of each subsequent inspection report and cab card. The period for removal of flues, upon formal application to the Director, Bureau of Railroad Safety may be extended, if investigation shows that conditions warrant it. The application should include a check or money order in the amount of $25.00 payable to the Federal Railroad Administration.

Interpretation:

Rule 10. Flues to be removed.-(a) Regarding "Extension of time."

If an extension of time is desired, each locomotive should be taken up individually with the chief inspector approximately 60 days before the work becomes due, in order that a proper investigation may be made before the flues become delinquent. The decision reached will be based on conditions disclosed by the United States inspector covering each locomotive.

In each case the application should show-

1. Number of each locomotive for which the extension is desired.
2. Date boiler was built.

3. Date of previous removal of flues.
4. Mileage made since flues were removed and interior of boiler cleaned and inspected.
5. Class of service in which the locomotive is engaged.
6. Number of full calendar months claimed out of service.
7. Period of time for which the extension is desired.
8. Approximate date when it will be convenient to have the locomotive inspected with the dome cap and throttle standpipe removed to permit an interior inspection.
9. Point at which the locomotive will be available for inspection.

(b) For locomotives stored for one or more full calendar months, removal of flues will be due after 48 calendar months' service, providing such service is performed within five consecutive years and the requirements of rule 10 are fully complied with.

(c) Locomotives removed from service when flues become due for removal, need not have the flues removed until just prior to being returned to service.

(d) The removal of super heater flues every four years will not be required provided the flues are in good condition and the boiler can be thoroughly cleaned and inspected without their removal. This modification is subject to withdrawal if carriers permit defective or unserviceable superheater flues to remain in service.

Note: The purpose of the removal of the flues is so that the entire interior of the boiler can be thoroughly cleaned and inspected for cracks, pitting, grooving and indications of overheating and for damage where mud has collected or heavy scale formed.

The regulation states that formal application must be made to the Director, Bureau of railroad Safety. This duty has been transferred and formal application must now be made to the Regional Director in the region in which a steam locomotive is housed. Further, the Regional Specialist will perform the duties assigned to the chief inspector described in the interpretation.
Arrangements for the inspection is made by the regional specialist, who will assign a qualified MP&E inspector to perform the inspection. The inspector should contact the operator or owner of the locomotive and arrange a date for the inspection. The inspector should have the locomotive prepared in the following manner to expedite the inspection.

1. Have all wash-out plugs removed from the boiler and fire box and have the interior of the boiler and the water space around the fire box thoroughly cleaned of all sediment.

2. Have the front end opened and thoroughly cleaned and the front flue sheet exposed for inspection.

3. Have the fire box cleaned to the extent that the back flue sheet and fire box sheets can be carefully examined.

4. Have the throttle removed, if necessary, to gain entrance into the interior of the boiler.

5. At the discretion of the inspector, several flues may be ordered removed from the bottom of the flue bundle to inspect the bottom of the boiler.

6. Make an inspection of the entire locomotive to assess its general condition.

After the inspection, the inspector should not inform the railroad or owner as to whether the boiler is acceptable for continued service. This decision is to be made in conjunction with the Regional Director and Regional Specialist. The railroad or owner will be notified in writing of the final decision. The extension should be granted based upon the satisfactory condition of the boiler only, and not on the other areas of the locomotive. Any non-complying condition found on the locomotive should be reported and corrected. Keep in mind that safety is the paramount goal of this inspection, and if the boiler gives the inspector concern he should recommend that the extension not be granted.

If the inspector finds that a steam locomotive to be inspected has loose or friable asbestos which could be disturbed when contacted, the railroad shall be advised that the inspection will not be made until such asbestos is removed or completely sheathed or sealed. **See General Bulletin G-92-03A.**

Defect Codes

230.010 Flues to be removed.

Regulation:

§230.11 Method of inspection.

The entire interior of the boiler must then be examined for cracks, pitting, grooving, or indications of over heating and for damage where mud has collected, or heavy scale formed. The edges of plates, all laps, seams, and points where cracks and defects are likely to develop or which an exterior examination may have indicated, must be given an especially minute examination. It must be seen that braces and stays are taut, that pins are properly secured in place, and that each is in condition to support its proportion of the load.

Defect Codes

230.011 Method of inspection.

Regulation:

§230.12 Repairs.

Any boiler developing cracks in the barrel shall be taken out of service at once, thoroughly repaired, and reported to be in satisfactory condition before it is returned to service.

Defect Codes

230.012 Repairs.

Regulation:

§230.13 Lap-joint seams.

Every boiler having lap-joint longitudinal seams without reinforcing plates shall be examined with special care to detect grooving or cracks at the edges of the seams.

Defect Codes

230.013 Lap-joint seams.

Regulation:

§230.14 Fusible plugs.

If boilers are equipped with fusible plugs they shall be removed and cleaned of scale at least once every month. Their removal must be noted on the report of inspection.

Defect Codes

230.014 Fusible plugs.

INSPECTION OF EXTERIOR OF BOILER

Regulation:

§230.15 Time of inspection.

The exterior of every boiler shall be thoroughly inspected before the boiler is put into service and whenever the jacket and the lagging are removed.

Defect Codes

230.015 Time of inspection.

Regulation

§230.16 Lagging to be removed.

The jacket and lagging shall be removed at least once every 5 years and a thorough inspection made of the entire exterior of the boiler while under hydrostatic pressure. The jacket and lagging shall also be removed whenever on account of indications of leaks the United States inspector or the railroad company's inspector considers it desirable or necessary.

Interpretation:

Rule 16. Lagging to be removed.-For locomotives stored for one or more full calendar months, jacket and lagging will be due for removal after 60 calendar months' service, provided such service is performed within six consecutive years. Portions of calendar months out of service will not be counted. Time out of service must be properly accounted for by out of service reports filed with the United States inspector and notations of months claimed out of service made on the back of each subsequent inspection report and cab card.

Note: The out of service reports will be submitted to the Regional Director's office.

Defect Codes

230.016 Lagging to be removed.

TESTING BOILERS

Regulation:

230.17 Time of testing.

> **Every boiler, before being put into service and at least once every 12 months thereafter, shall be subjected to hydrostatic pressure 25 percent above the working steam pressure.**

Interpretation:

Rule 17. Time of testing boiler. -(a) The words "before being put into service" refer to new locomotives before entering service the first time; after that, hydrostatic testing should be made every 12 months.

(b) When locomotive is taken into shop for new fire box or new flues a hydrostatic test should be applied before the locomotive is put in service, in accordance with rule 17, even through the hydrostatic test may not be due until some later date and an annual locomotive inspection and repair report field covering the locomotive.

(c) It has been agreed to accept as the date of the hydrostatic test the date on which the inspection has been completed and the locomotive is ready for service.

(d) For locomotives stored for one or more full calendar months, hydrostatic tests will be due after 12 calendar months' service,provided such service is performed within 24 consecutive months. Portions of calendar months out of service will not be counted. Time out of service must be properly accounted for by out-of-service reports filed with the United States inspector and notations of months claimed out of service made on the back of each subsequent inspection report and cab card.

(e) A locomotive stored when hydrostatic test becomes due need not be given such test until immediately prior to its being returned to service.

(f) When the working pressure of any boiler is increased above that shown on the specification card or previous annual locomotive inspection and repair report, the boiler must be subject to hydrostatic pressure 25 per cent above the increased pressure ,and an annual locomotive inspection and repair report filed, covering the hydrostatic test, and an alteration report filed, as required by rule 54, covering the increased pressure.

> **Note:** The hydrostatic test is the responsibility of the railroad.

There is no requirement for the MP&E inspector to observe the hydrostatic test, even if it may be desirable to do so. The hydrostatic test is usually done when an annual inspection of the

locomotive is performed.

Defect Codes

230.017 Time of testing boiler.

Regulation:

230.18 Removal of dome cap.

The dome cap and throttle standpipe must be removed at the time of making the hydrostatic test and the interior surface and connections of the boiler examined as thoroughly as conditions will permit. In case the boiler can be entered and thoroughly inspected without removing the throttle standpipe the inspector may make the inspection by removing the dome cap only, but the variation from the rule must be noted in the report of inspection.

Interpretation

Rule 18. Removal of dome cap.--(a) The fact that a locomotive is new does not relieve the railroad from removing the dome cap and throttle standpipe in accordance with rule 18 when the hydrostatic test is applied. It will therefore be necessary to remove the dome cap and throttle standpipe, in accordance with rule 18 and file report showing that the work has been done. (See Exhibit 2, item 11.)

(b) It is considered the better practice and is recommended that the dome cap be removed after hydrostatic test, in order to permit a thorough interior inspection after such test; but not instructions that have been issued which conflict in any way with this rule. (See Exhibit 2,item 11.)

(c) Where the boiler is equipped with an auxiliary dome or inspection manhole, the dome cap and throttle standpipe need not be removed. Where the boiler is entered through auxiliary dome or inspection manhole, notation should be made on the margin of the report "Boiler entered through auxiliary dome."

Defect Codes

230.018 Removal of dome cap.

Regulation:

230.19 Witness of test.

When the test is being made by the railroad company's inspector, an authorized representative of the company, thoroughly familiar with boiler construction, must personally witness the test and thoroughly examine the boiler while under hydrostatic pressure.

Defect Codes

230.019 Witness of test.

Regulation:

§230.20 Repairs and steam test.

When all necessary repairs have been completed, the boiler shall be fired up and the steam pressure raised to not less than the allowed working pressure, and the boiler and appurtenances carefully examined. All cocks, valves, seams, bolts, and rivets must be tight under this pressure and all defects disclosed must be repaired.

Defect Codes

230.020 Repairs and steam test.

STAYBOLT TESTING

Regulation:

§230.21 Time of testing rigid bolts.

All staybolts shall be tested at least once each month. Staybolts shall also be tested immediately after every hydrostatic test.

Interpretation

Rule 21. Time of testing rigid bolts.--(a) Stay bolts must be tested at least once each calendar month or every 30 days as nearly as operating conditions will permit on all locomotives in service. No objection, however, will be taken by the Bureau of Locomotive Inspection if the 30-day period is not exceeded by more than five days when conditions fully justify.

(b) The practice of making a stay-bolt inspection during the first part of one month and a second test during the latter part of the following month, allowing the period between inspections to materially exceed 30 days, is not considered a proper compliance with this rule, nor with the intent and purpose thereof.

(c) All required inspections and tests falling due at the monthly period should be made while the locomotive is out of service for monthly inspection. The date of the monthly locomotive inspection and repair report should be the date on which the work is completed and the locomotive made ready for service.

(d) If stay bolts which are behind brickwork or behind grate bearers have a telltale hole three-sixteenths inch in diameter their entire length which is kept open at all times, the removal of the brickwork or grate bearers each month for the purpose of hammer testing such bolts will not be required. This will not, however, relieve from making a thorough inspection when the brickwork is removed, nor will it relieve from removing the brickwork for an inspection whenever a United States inspector or the railroad company's inspector considers it desirable or necessary.

Defect Codes

230.021 Time of testing rigid staybolts

Regulation:

§230.22 Method of testing rigid bolts.

The inspector must tap each bolt and determine the broken bolts from the sound or the vibration of the sheet. If staybolt tests are made when the boiler is filled with water, there must be not less than 50 pounds pressure on the boiler. Should the boiler not be under pressure, the test maybe made after draining all water from the boiler, in which case the vibration of the sheet will indicate any unsoundness. The latter test is preferable.

Defect Codes

230.022 Method of testing rigid staybolts.

Regulation:

§230.23 Method of testing flexible staybolts with caps.

(a) Except as provided in paragraph (b) of this section, all staybolts having caps over the outer ends shall have the caps removed at least once every 2 years and the bolts and sleeves examined for breakage. Each time the hydrostatic test is applied the hammer test required by 230.21 and 230.22 shall be made while the boiler is under hydrostatic pressure not less than the allowed working pressure.

(b) When flexible staybolts are provided with a telltale hole not less than three-

sixteenths inch nor more than seven thirty-seconds inch in diameter, extending the entire length of the bolt and into the head not less than on-third of its diameter, and are opened and tested each time the hydrostatic test is applied, with an electrical or other instrument approved by the Bureau of Railroad Safety, that will positively indicate when the tell tale holes are open their entire length, the caps will not be required to be removed. When this test is completed, the hydrostatic test must be applied and all staybolts removed which show leakage through the telltale hole.

The inner ends of the telltale holes must be kept closed with fireproof porous material that will exclude foreign matter and permit leakage of steam or water, if the bolt is broken or fractured, into the telltale hole. When this test is completed the ends of the telltale holes shall be closed with material of different color than that removed and a record kept of colors used.

(c) The removal of flexible staybolt caps and other tests shall be reported on the report of inspection Form No. 3, and a proper record kept in the office of the railroad company of the inspections and tests made.

(d) Fire-box sheets must be carefully examined at least once every month for mud burn, bulging, and indication of broken staybolts.

(e) Staybolts caps shall be removed or any of the above tests made whenever the United States inspector or the railroad company's inspector considers it desirable in order to thoroughly determine the condition of staybolts or staybolt sleeves.

Interpretation

Rule 23. Method of testing flexible stay bolts with caps.
--(a) When locomotives are stored for one or more full calendar months, the removal of flexible stay-bolts caps for the purpose of inspection will be due after 24 calendar months' service, provided such service is performed within three consecutive years. Portions of calendar months out of service will not be counted. time out of service must be properly accounted for by out-of-service reports filed with the United States inspector and notations of months claimed out of service made on the back of each subsequent inspection report and cab card.

(b) A locomotive stored when flexible stay-bolt cap removals are due need not be given such test until immediately prior to being returned to service.

(c) When locomotives are being given their annual inspection and test, flexible stay-bolt caps should be removed at the time of making this inspection, if they become due for removal before another annual inspection is due, and their removal shown on Form 3. One of the principal reasons urged for extending the time for removal of flexible stay-bolt caps from 18 months to 2 years was for the purpose of bringing the test due at every second annual inspection.

(d) If hollow flexible stay bolts with caps are tested with an electrical or other instrument approved by the Bureau of Locomotive Inspection as provided for in rule 23 (b) it is not required that caps be removed for test purposes, but the instrument test must be made each time the hydrostatic test is applied. (See rule 17 (d).)

Defect Codes

230.023 Method of testing flexible staybolts with caps.

Regulation:

§230.24 Method of testing flexible staybolts without caps.

Flexible staybolts which do not have caps shall be tested once each month, the same as rigid bolts.

Each time a hydrostatic test is applied such staybolt test shall be made while the boiler is under hydrostatic pressure not less than the allowed working pressure and proper notation of such test made on Form No. 3.

Interpretation

Rule 24. Method of testing flexible stay bolts without caps.
--A locomotive stored when test of flexible stay bolts without caps is due need not be given such test until immediately prior to its being returned to service.

Defect Codes

230.024 Method of testing flexible staybolts without caps.

Regulation:

§230.25 Broken staybolts.

No boiler shall be allowed to remain in service when there are two adjacent staybolts bolts broken or plugged in any part of the fire box or combustion chamber, nor when three or more are broke or plugged in a circle 4 feet in diameter, nor when five or more are broken or plugged in the entire boiler.

Interpretation

Rule 25. Broken stay bolts.--(a) "Plugged" stay bolt means telltale hole has been plugged or riveted over or telltale hole missing.

(b) Telltale holes leaking, plugged, riveted over, or missing will be counted as broken stay bolts.

Defect Codes

230.025 Broken staybolts.

Regulation:

§230.26 Telltale holes.

All staybolts shorter than 8 inches applied after July 1, 1911, except flexible bolts, shall have telltale holes three-sixteen this inch in diameter and not less than 1 1/4 inches deep in the outer end. These holes must be kept open at all time.

Interpretation

Rule 26. Telltale holes.--(a) When telltale holes one-eighth inch in diameter were drilled in stay bolts applied before July 1, 1911, they have been accepted, provided they were of proper depth and were kept open.

(b) The depth of telltale hole specified in the rule is the minimum depth. To serve their intended purpose telltale holes should extend into the bolts beyond the usual point of breakage. Several fatal accidents have resulted from failures of reduced body stay bolts where the telltale holes did not extend beyond the root of the fillet.

Defect Codes

230.26 Telltale holes.

Regulation:

§230.27 Drilling.

All staybolts shorter than 8 inches, except flexible bolts and rigid bolts which are behind frames and braces, shall be drilled when the locomotive is in the shop for heavy repairs, and this work must be completed prior to July 1, 1914.

Interpretation

Rule 27. All staybolts behind frame and braces should be drilled when the boiler is taken from its frame, or at the first opportunity that the bolts are available for drilling.

Defect Codes

220.27 Drilling.

STEAM GAUGES

Regulation:

§230.28 Location of gauges.

Every boiler shall have at least one steam gauge which will correctly indicate the working pressure. Care must be taken to locate the gauge so that it will be kept reasonably cool and can be conveniently read by the enginemen.

Defect Codes

230.28 Location of gauges.

Regulation:

§230.29 Siphon.

Every gauge shall have a siphon of ample capacity to prevent steam entering the gauge. The pipe connection shall enter the boiler direct and shall be maintained steam tight between boiler and gauge. The siphon pipe and its connections to the boiler must be cleaned each time the gauge is tested.

Defect Codes

230.029 Siphon.

Regulation:

§230.30 Time of testing.

Steam gauges shall be tested at least once every 3 months and also when any irregularity is reported.

Defect Codes

230.30 Time of testing.

Regulation:

§230.31 Method of testing.

Steam gauges shall be compared with an accurate test gauge or dead weight tester and gauges found inaccurate shall be corrected before being put into service.

Interpretation

Rule 31. Method of testing steam gauges.--At points where monthly or annual inspections and tests are required to be made a dead-weight tester should be supplied. Where test gauges are used, it must be known that the test gauges are used, it must be known that the test gauge is accurate when comparisons are made; when testing steam gauges, they should be removed from the boiler. Comparison with a second gauge attached to the boiler under pressure is not considered safe and proper practice.

Defect Codes

230.031 Method of testing.

Regulation:

§230.32 Badge plates.

A metal badge plate showing the allowed steam pressure shall be attached to the boiler head in the cab. If boiler head is lagged, the lagging and jacket shall be cut away so that the plate can be seen.

Defect Codes

230.032 Badge plates.

Regulation:

§230.33 Boiler number.

The builder's number of the boiler, if known, shall be stamped on the dome. If the builder's number of the boiler cannot be obtained, an assigned number which shall be used in making out specification card shall be stamped on dome.

Interpretation:

Rule 33. Boiler number.--(a) The builder's number if known, should be stamped on the dome with figures at least three-eighths of an inch high, preceded by the builder's name or initials, as "Baldwin No. 000." If builder's number is unknown, the assigned number should be stamped on the dome, preceded by the name or initials of the railroad, as "B. & O. No. 000." Builder numbers once recorded on specification cards can not thereafter be changed.

(b) In either case the number and initials should be stamped horizontally on the front side of dome ring near the top.

(c) If a pressed-steel dome is used, the number and initials should be stamped horizontally on the front side of the dome at the upper edge of the vertical surface.

(d) No objection has been made to the location of the number stamped on the dome where such work was done previous to the item a standard location was decided upon.

(e) Numbers which are stamped after January 10, 1912, however, should be in the proper location. Only the minimum size of the figures has been fixed.

Defect Codes

230.033 Boiler number.

SAFETY VALVES

Regulation:

§230.34 Number and capacity.

Every boiler shall be equipped with at least two safety valves, the capacity of which shall be sufficient to prevent under any conditions of service, an accumulation of pressure more than 5 percent above the allowed steam pressure.

Defect Codes

230.34 Safety valves.

Regulation:

§230.35 Setting of safety valves.

Safety valves shall be set to pop at pressures not exceeding 6 pounds above the working steam pressure. When setting safety valves, two steam gauges shall be used, one of which must be so located that it will in full view of the persons engaged in setting such valves; and if the pressure indicated by the gauges varies more than

3 pounds they shall be removed from the boiler, tested, and corrected before the safety valves are set. Gauges shall in all cases be tested immediately before the safety valve are set or any change made in the setting. When setting safety valves the water level in the boiler shall not be above the highest gauge cock.

Defect Codes

230.035 Setting of safety valves.

Regulation:

§230.36 Time of testing.

Safety valves shall be tested under steam at least once every 3 months, and also when any irregularity is reported.

Defect Codes

230.036 Time of testing.

WATER GLASS AND GAUGE COCKS

Regulation:

§230.37 Number and location.

Every boiler shall be quipped with at least one water glass and three gauge cocks. The lowest gauge cock and the lowest reading of the water glass shall be not less than 3 inches above the highest part of the crown sheet. Locomotives which are not now equipped with water glasses shall have them applied on or before July 1, 1912.

Defect Codes

230.037 Number and location of water glass and gauge cocks.

Regulation:

§230.38 Water glass valves.

All water glasses shall be supplied with two valves or shutoff cocks, one at the upper and one at the lower connection to the boiler, and also drain cock, so constructed and located that they can be easily opened and closed by hand.

Interpretation

Rule 38. Water-glass valves.--No particular type of valve is required for water glasses or drain cocks, but such valves must be kept tight, and must be so constructed that they can be kept clean and open and so located and maintained that they can be easily opened and closed by hand, extension handles being provided if necessary.

Defect Codes

230.038 Water glass valves.

Regulation:

§230.39 Time of cleaning.

The spindles of all gauge cocks and water glass cocks shall be removed and cocks thoroughly cleaned of scale and sediment at least once each month.

Interpretation

Rule 39. Time of cleaning.--Parts of water columns and connections where scale or sediment is liable to accumulate should be thoroughly cleaned each time gauge cocks and water-glass cocks are cleaned.

Defect Codes

230.039 Time of cleaning.

Regulation:

§230.40 Tests required before each trip.

All water glasses must be blown out and gauge cocks tested before each trip and gauge cocks must be maintained in such condition that they can be easily opened and closed by hand without the aid of a wrench or other tool.

Defect Codes

230.040 Tests required before each trip.

Regulation:

§230.41 Water and lubricator glass shields.

All tubular water glasses and lubricator glasses must be equipped with a safe and suitable shield which will prevent the glass from flying in case of breakage, and such shield shall be properly maintained.

Interpretation

Rule 41. Water and lubricator glass shield.--(a) Since July 1, 1911, the effective date of the locomotive boiler inspection law, a great number of accidents have been reported growing out of burst water and lubricator glasses. In an effort to effect a diminution of water and lubricator glass accidents, instructions have been issued to all Government inspectors to remove from service all locomotives which are not equipped with water and lubricator glass shields in accordance with the rules.

(b) As practically all water-glass shields are patented, this bureau can not undertake to approve any particular style or shield.

(c) A spiral used as a shield is not considered a satisfactory compliance with rule 41.

(d) Shields of wire mesh have been accepted, provided the wire used in their construction is allowed to run no coarser than eight meshes per inch.

(e) Water glasses and water-glass shields should be so located, constructed, and maintained that the enginemen can at all times have a clear and easy view of the water in the glass from their usual and proper positions in the cab.

Defect Codes

230.041 Water and lubricator glass shields.

Regulation:

§230.42 Water glass lamps.

All water glasses must be supplied with a suitable lamp properly located to enable the engineer to easily see the water in the glass.

Defect Codes

230.042 Water glass lamps.

INJECTORS AND FLUE PLUGS

Regulation:

§230.43 Injectors.

Injectors must be kept in good condition, free from scale, and must be tested before each trip. Boiler checks, delivery pipes, feed water pipes, tank hose and tank valves must be kept in good condition, free from leaks and from foreign substances that would obstruct the flow of water.

Interpretation

Rule 43. Regarding injectors.--Injectors and long injector steam pipes should be securely braced so as to avoid vibration. Records show that many serious and fatal accidents have been caused by the failure of injector steam pipes and connections.

Defect Codes

230.043 Injectors.

Regulation:

§230.44 Flue plugs.

Flue plugs must be provided with a hole through the center not less than three-fourths inch in diameter. When one or more tubes are plugged at both ends the plugs must be tied together by means of a rod not less than five-eighths inch in diameter. Flue plugs must be removed and flues repaired at the first point where such repairs can properly be made.

Interpretation

Rule 44. Flue plugs.--If a plug is driven in, regardless of size of hole in it, it will have to be removed in accordance with rule 44. if plug is rolled and pressed, it is constructed as a thimble and no objection will be interposed to its use at present, providing the number applied are not excessive. The use of flue thimbles, however, is not considered good practice.

Defect Codes

230.044 Flue plugs.

WASHING BOILERS

Regulation:

§230.45 Time of washing.

All boilers shall be thoroughly washed as often as the water conditions require, but not less frequently than once each month. All boilers shall be considered as having been in continuous service between washouts unless the dates of the days that the boiler was out of service are properly certified on washout reports on the report of inspection.

Interpretation

Rule 45. Time of washing boilers.--(a) All water changes have not been considered as washouts, and no objection has been made to the removal of the plugs in the water legs to facilitate the emptying of the boiler, however, where all plugs in water legs and back head plugs or plugs in the barrel of the boiler are removed and hose used, it is considered a washout, and it is insisted that all plugs be removed and the boiler properly washed.

(b) The removal of all plugs and a thorough washing of the boiler is also insisted on as often as water conditions require. It is not a compliance with this rule to remove all plugs once each month where water conditions require a more frequent washing. All plugs must be removed each time the boiler is washed. Experience has demonstrated that it is just as important to get all the soluble matter which causes foaming out of the boiler as it is to get out the incrusting solids.

Note: The purpose of washing the boiler is to remove all loose scale, hard minerals, solubles which cause foaming, and sediment which accumulate naturally when water is converted into steam. If it is not washed out on a regular basis, the accumulation would become excessive, especially in the water legs around the fire box, creating hot spots in the fire box sheets which could lead to severe damage. Most steam locomotives in service today are used as tourist attractions generally operating on a seasonal schedule. The inspector should learn about each steam operation and how the boiler washouts are accomplished.

Defect Codes

230.045 Time of washing.

Regulation:

§230.46 Plugs to be removed.

When boilers are washed, all washout, arch, and water bar plugs must be removed.

Interpretation

Rule 46. Plugs to be removed.--The rules require that all washout plugs must be removed. We find that some roads claim that washout plugs are inspection plugs; but all inspection plugs should be considered as washout plugs, as they were put in the boiler of for the purpose of washing the boiler and inspecting the boiler during the washing of the same.

Defect Codes

230.046 **Plugs to be removed.**

Regulation:

230.47 Water tubes.

Special attention must be given the arch and water bar tubes to see that they are free from scale and sediment.

Interpretation:

Rule 47. Water tubes.--Arch and water bar tubes should be thoroughly cleaned with a mechanical cleaner each time the boiler is washed; it is insisted that they be thoroughly cleaned in the manner at each monthly and annual inspection. Arch or water bar tubes found defective, blistered, or bulged should be removed.

Defect Codes

230.047 Water tubes.

Regulation:

230.48 Office record.

An accurate record of all locomotive boiler washouts shall be kept in the office of the railroad company. The following information must be entered on the day that the boiler is washed:
(a) Number of locomotive
(b) Date of washout.
(c) Signature of boiler washer or inspector.
(d) Statement that spindles of gauge cocks and water glass cocks were removed and cocks cleaned.

(e) Signature of boiler inspector or the employee who removed the spindles and cleaned the cocks.

Defect Codes

230.048 Office record.

STEAM LEAKS

Regulation:

230.49 Leaks under lagging.

If a serious leak develops under the lagging, an examination must be made and the leak located. If the leak is found to be a crack in the shell or to any other defect which may reduce safety, the boiler must be taken out of service at once, thoroughly repaired, and reported to be in satisfactory condition before returned to service.

Defect Codes

230.049 Leaks under lagging.

Regulation:

230.50 Leaks in front of enginemen.

All steam valves, cocks, and joints, studs, bolts and seams shall be kept in such repair that they will not emit steam in front of the enginemen, so as to obscure their vision.

Defect Codes

230.050 Leaks in front of enginemen.

FILING REPORTS

Regulation:

230.51 Report of inspection.

Not less than once each month and within 10 days after each inspection a report of inspection, Form No.1, size 6 by 9 inches shall be filed with the district inspector of

locomotive boilers for each locomotive used by a railroad company, and a copy shall be filed in the office of the chief mechanical officer having charge of the locomotive.

Interpretation:

Rule 51. Monthly locomotive inspection and repair report.
(This interpretation also applies to Rule 159 of this part.)
-(a) A Monthly locomotive inspection and repair report must be filed at least once each calendar month for every locomotive in service and as nearly every 30 days as operating conditions permit; except, no monthly report will be required for the month in which an annual report has been filed. No objection, however, will be taken by the Bureau of Locomotive Inspection if the thirty day period is not exceeded by more than five days when conditions fully justify. The practice of making an inspection during the first part of one month and a second inspection during the latter part of the following month, allowing a period between inspections to materially exceed 30 days, is not considered a proper compliance with this rule nor with the intent and purpose thereof.

(b) All inspections and tests falling due at monthly periods should be made while the locomotive is out of service for this inspection.

(c) The date of the report should be the date on which the inspection and repairs are completed and locomotive made ready for service.

(d) When inspections are made at outlying points and the foreman in charge makes the inspections and repairs, in addition to certifying to the report, he may also sign as officer in charge, inasmuch as he is the one being held responsible.

(e) In subscribing to the reports any person authorized to administer an oath may do so.

(f) The report should be sworn to by the inspector or inspectors who make the inspections immediately after the inspections and repairs have been completed and the locomotive made ready for service. The officer in charge certifies to the correctness of the report.

(g) If the railroads desire for their own protection to have the master mechanic sign the report in addition to the officer in charge, there is no objection to their doing so.

(h) It is not required that the affidavit be executed on the records filed in the railroad company's office.

(i) The reports must be filed with the United States inspector within 10 days after date of inspection.

(j) The matter of relieving the railroad from the payment of postage on reports is something the

Bureau of Locomotive Inspection has no jurisdiction.

(k) When locomotives are used in stationary service, items on the locomotive inspection and repair reports pertaining to the boiler and its appurtenances should be correctly answered. Items pertaining to running gear, driving gear, tender, etc., may be answered by stating "Used in stationary service." So long as a locomotive remains on its own wheels the boiler and its appurtenances should be tested and made to meet the requirements of the rule and regulations and a report filed, as required by Rule 51.

(l) When the road number of a locomotive is changed, the first inspection and repair report rendered thereafter should show in the upper right-hand corner the old and new number:

"Old N. 000
New No. XXX"

The Form No. 1 is included in its entirety.

MONTHLY LOCOMOTIVE INSPECTION AND REPAIR REPORT

Form No. 1.

_____, 19_____.
_____ Company.

Locomotive:
Number _____
Initial _____

In accordance with the act of Congress approved February 17, 1911, as amended March 4, 1915, and the rules and instructions issued in pursuance thereof and approved by the Federal Railroad Administration, all parts of locomotive No. _____, including the boiler and appurtenances, were inspected on _____, 19___, at _____ and all defects disclosed by said inspection have been repaired, except as noted on the back of this report.

1. Steam gauges tested and left in good condition on _____, 19___.

2. Safety valves set to pop at _____ pounds, _____ pounds, _____ pounds on _____, 19___.

3. Were both injectors tested and left in good conditions? _____

4. Were steam leaks repaired? _____

5. Condition of brake and signal equipment, _____
6. Condition of draft gear and draw gear, _____
7. Condition of driving gear, _____
8. Condition of running gear, _____
9. Condition of tender, _____
I certify that the above report is correct, _____,___
Inspector.
10. Was boiler washed and gauge cocks and water glass cock spindle removed and cocks cleaned? _____
11. Were steam leaks repaired? _____
12. Condition of staybolts and crown stays, _____
13. Number of staybolts and crown stays renewed, _____
14. Condition of flues and firebox sheets, _____
15. Condition of arch and water bar tubes, if used,_____
16. Were fusible plugs removed and cleaned? _____
17. Date of previous hydrostatic test, _____, 19___.
18. Date of removal of caps from flexible staybolts, _____, 19_____.
I certify that the above report is correct,

_____, _____
Inspector.
State of _____ County of _____ as:
Subscribed and sworn to before me this _____ day of _____, 19___, by _____ inspectors of the _____ Company.

_____
Notary Public.
The above work has ben performed and the report is approved.

_____
Office of Charge.

Note: The railroad or owner must file a Form No. 1, Monthly Inspection and Repair Report with the Regional Directors office in the region in which the locomotive is located for each steam locomotive in use. A report must also be filed for each month in which the locomotive is out-of-service with a notation across the front of the report similar to the following: "Locomotive not used from..... to ..... account of being out-of-service and not used."

Where the interpretation refers to the Bureau of Locomotive Inspection, substitute the Federal Railroad Administration.

Defect Codes

230.051 Report of inspection.

Regulation:

§230.52 Posting of copy.

A copy of the monthly inspection report, Form No. 1, §230.51 or annual inspection report, Form No. 3, [1] properly filled out, shall be placed under glass in a conspicuous place in the cab of the locomotive before the boiler inspected is put into service.

Defect Codes

230.052 Posting of copies.

Regulation:

230.53 Reports of tests.

Not less than once each year and within 10 days after the hydrostatic and other required tests have been completed a report of such tests showing the general condition of the boiler and repairs made shall be submitted on the Form No. 3, [1] size 6 by 9 inches,and filed with the United States inspector, and a copy shall be filed i the office of the chief mechanical officer having charge of the locomotive. The monthly report will not be required for the month in which this report is filed.

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[1] **Form No. 3 should be printed on yellow paper.**

Interpretations:

Rule 53. Annual locomotive inspection and repair report.
(This interpretation also applies to Rule 161 of this part.)
-(a) An annual locomotive inspection and repair report must be filed at least once every 12 months. No objection, however, will be taken by the Bureau of Locomotive Inspection if the 12-month period is not exceeded by more than 10 days when conditions fully justify.

(b) All inspections and tests falling due at annual periods should be made while the locomotive is out of service for this inspection.

(c) The date of the report should be the date on which the inspection and repairs are completed and locomotive made ready for service.

(d) In subscribing to the reports any person authorized to administer an oath may do so.

(e) The report should be sworn to by the inspector or inspectors who make the inspections immediately after the inspections and repairs have been completed and the locomotive made ready for service. The officer in charge certifies to the correctness of the report.

(f) If the railroads desire for their own protection to have the master mechanic sign the report in addition to the officer in charge, there is no objection to their doing so.

(g) It is not required that the affidavit be executed on the records filed in the railroad company's office.

(h) The reports must be filed with the United States inspector within 10 days after date of inspection.

(i) The matter of relieving the railroad from the payment of postage on reports is something the Bureau of Locomotive Inspection has no jurisdiction.

(j) When locomotives are used in stationary service, items on the locomotive inspection and repair reports pertaining to the boiler and its appurtenances should be correctly answered. Items pertaining to running gear, driving gear, tender, etc., may be answered by stating "Used in stationary service." So long as a locomotive remains on its own wheels the boiler and its appurtenances should be tested and made to meet the requirements of the rule and regulations and a report filed, as required by Rule 53.

(k) When the road number of a locomotive is changed, the first inspection and repair report rendered thereafter should show in the upper right-hand corner the old and new number:

"Old N. 000
New No. XXX"

Note: The railroad or owner must file a Form No. 3, Annual Repair Report with the Regional Director's office for each steam locomotive in use. In the month in which the Form No. 3 is submitted, a Form No. 1 is not required and need not be submitted.

Defect Codes

229.053 Reports of tests.

Regulation:

230.54 Specification card.

(a) **A specification card, size 8 by 10 1/2 inches, Form No. 4, containing the results of the calculations made in determining the working pressure and other necessary data shall be filed in the office of the Director, Bureau of Railroad Safety, for each locomotive boiler. A copy shall be filed in the office of the chief mechanical office having charge of the locomotive. Every specification car d shall be verified by the oath of the engineer making the calculations, and shall be approved by the chief mechanical officer. These specification cards shall be filed as promptly as thorough examination and accurate calculation will permit. Where accurate drawings of boilers are available, the data for specification card, Form No. 4, may be taken from the drawings, and such specification cards must be completed and forwarded prior to July 1, 1912. Where accurate drawings are not available, the required data must be obtained at the first opportunity when general repairs are made, or when flues are removed. Specification cards must be forwarded within 1 month after examination has been made, and all examinations must be completed and specification cards filed prior to July 1,1913, flues being removed if necessary to enable the examination to be made before this date.**

(b) **When any repairs or changes are made which affect the data shown on the specification card a corrected card or an alteration report on an approved from, size 8 by 10 1/2 inches, properly certified to, giving details of such changes, shall be filed within 30 days from the date of their completion.**

This report should cover:
(1) Application of new barrel sheets or domes.
(2) Application of patches to barrels or domes of boilers or to portion of wrapper sheet of crown bar boilers which is not supported by staybolts.
(3) Longitudinal seam reinforcements.
(4) Changes in size or number of braces,giving maximum stress.
(5) Initial application of superheaters, arch or water bar tubes, giving number and dimensions of tubes.
(6) Changes in number or capacity of safety valves.
Report of patches should be accompanied by a drawing or blueprint of the patch, showing its location in regard to the center line of boiler, giving all necessary dimensions, and showing the nature and location of the defect. Patches previously applied should be reported the first time the boiler is stripped to permit an examination.

Interpretation:

Rule 54. (a) Specification card.

(a) A specification card is required for the boiler of each locomotive used, or permitted to be used, on the lines of a common carrier.

(b) If builder's number of boiler is unknown, a number should be assigned to the boiler, and the item "Builder's No. of Boiler" on specification number should be changed "Assigned No. of Boiler." This assigned number should also appear in the affidavit. The builder's number of the boiler must be used wherever it is known.

(c) Where a boiler is changed from one locomotive to another, such change must be promptly reported, giving the locomotive numbers and the boiler numbers involved. When boilers are removed from locomotives, their disposition must be known. Boiler numbers once recorded on specification cards can not be changed.

Rule 54. (b) Alteration reports.

(a) An accurate description of alterations should be made. Drawings of patches should show whether the plate underneath patches were removed, the location and extent of cracks, pitting, corrosion, and grooving should be shown and dimensioned if the defective plate was not removed, the size of rivets and the size of rivet holes should be given, and the reports should state whether iron or steel rivets were used. If authentic records of tests of material used in making repairs are available the lowest tensile strength as shown by test should be given; otherwise 50,000 pounds for steel and 45,000 pounds for wrought iron will be allowed as provided by Rule 4. It is not necessary to report patches on surfaces supported by stay bolts.

(b) Initial installations and removals of thermic syphons should be reported. Reports filed to cover initial installations should show the number of syphons installed, the construction of the device, the manner of application, and the manner in which the fire-box sheets are stayed in the immediate vicinity of the syphons.

(c) Initial installations and removals of low-water alarms should be reported. Reports filed to cover initial installations should show the trade name of the devices and the manner of application.

Note: Section (a) A Form No. 4, Specification Card, must be completed and submitted to the Regional Director in whose region the locomotive is located. The Form No. 4 need not be completed and submitted prior to the locomotive being used, but should be prepared as soon as practicable. If the railroad or owner has no Form No. 4 from a previous owner, then one must be prepared from actual measurements and inspection made by a competent person, usually a mechanical engineer.

Section (b) This report has been standardized as Form No. 19, **ALTERATION REPORT FOR LOCOMOTIVE BOILERS.** It is to be submitted to the Regional Director in whose region the locomotive is located.

230.54 Specification card.

Regulation:

230.55 Accident reports.

In the case of an accident due to failure, from any cause, of a locomotive boiler or any part of appurtenance thereof, resulting in serious injury or death to one or more persons, the carrier on whose line the accident occurred shall immediately report he accident by toll free telephone, Area Code 800-424-0201. The report shall state the nature of the accident, the number of persons killed or seriously injured, the place at which is occurred, as well as where the locomotive may be inspected. Confirmation of this report shall be immediately mailed to the Associate Administrator for Safety, Federal Railroad Administration, Washington, D.C. 20590, and contain a detailed report of the accident, including, to the extent known, the causes and a complete list of the killed or injured.

[41 FR 15848, Apr. 15, 1976]

Interpretation

Rule 55. Accident reports. (This interpretation also applies to Rule 162 of this part)

(a) Any accident resulting from failure from any cause of a locomotive or tender, including the boiler, or any of their appurtenances, resulting in serious injury or death to one or more persons should be immediately reported by wire to the Chief Inspector at his office in Washington, D. C. Attention is directed to section 8 of the locomotive boiler inspection act, as amended, which provides in part as follows:
* * * where the locomotive is disabled to the extent that it can not run by its own steam, the part or parts affected by said accident shall be preserved by said carrier intact so far as possible without hinderance or interference to traffic until after said inspection. * * *

(b) Regarding "seriousness of accidents before being necessary to report to the Bureau of Locomotive Inspection":

(c) A serious injury is defined as an injury which prevents an employee from performing his accustomed duties for more than 3 days in the aggregate during the 10 days immediately following the accident.

(d) A "serious injury to a person other than an employee" is defined: "An injury sufficient to incapacitate the injured person from following his customary vocation or mode of life for a period of more than one day." This rule applies also to employees classed as passengers or trespassers.

(e) Where injuries are of a lesser degree, they are not the subject of report.

Defect Codes

203.055 Accident Reports

MISCELLANEOUS

(a) Regarding "Presence of representatives": In the interest of harmony representatives of the carriers are requested to be present wherever possible at all inspections and investigations.

(b) It is also suggested that the employee or his representative participate in the investigation of serious accidents where the employee is involved.

(c) The United States inspector can not make a report to the carrier's representative when inspections or investigations are made in the absence of the carrier's representative.

SUBPART B--STEAM LOCOMOTIVES AND TENDERS

Regulation:

§230.101 Design, construction, and maintenance.

The railroad company will be held responsible for the general design, construction, and maintenance of locomotives and tenders under its control.

Defect Codes

230.101 Design, construction, and maintenance.

Regulation:

§230.102 Responsibility for inspection and repairs.

The mechanical officer in charge, at each point where repairs are made, will be held responsible for the inspection and repair of all parts of locomotives and tenders under his jurisdiction. He must know that inspections are made as required and that the defects are properly repaired before the locomotive is returned to service.

Defect Codes

230.102 Responsibility for inspection and repair.

Regulation:

§230.103 Term "inspector"

The term "inspector" as used in the rules and instructions in this subpart means, unless otherwise specified, the railroad company's inspector.

Defect Codes

230.103 Term "inspector."

Regulation:

§230.104 Inspection after each trip or day's work

Each locomotive and tender shall be inspected after each trip, or day's work, and the defects found reported on an approved from to the proper representative of the company. This form shall show the name of the railroad, the initials and number of the locomotive, the place, date and time of the inspection the defects found and the signature of the employee making the inspection. The report shall be approved by the foreman, with proper written explanation made thereon for defects reported which were not repaired before the locomotive is returned to service. The report shall then be filled in the office of the railroad company the place where the inspection is made.

Form No. 2

_____Railroad.

Locomotive:

Number _____

Initials _____

LOCOMOTIVE INSPECTION REPORT

Instruction.--Each locomotive and tender must be inspected after each trip or day's work and report made on this form, whether needing reports or not. Proper explanation must be made there on for failure to repair any defects reported, and the form approved by foreman, before the locomotive is returned to service.

Inspected at _____, time _____m.

Date _____, 19____

Repairs needed:

_____

_____

_____

Condition of injectors _____ Water glass _____ Condition of gauge cocks _ Brakes _____Condition of piston rod and valve stem packing _____ Safety valve lifts at _____ pounds. Seats at _____ pounds.
Main reservoir pressure. _____ pounds
Brake pipe pressure, _____ pounds
(signature) _____,
(Occupation) _____
The above work has been performed, except as noted, and the report is approved.

_____
Foreman.

Note: Additional items may be added to this form if desired.

Interpretation

Rule 104. Daily inspection.--

(a) Any competent employee can be designated as an inspector.

(b) At terminals where roundhouse foreman or general foreman is unable to approve reports on account of lack of personal knowledge, the reports may be approved by a gang foreman who has direct knowledge that the work has been done. The person, however, approving the report must be one with responsibility.

(c) The initials of the road need not appear, providing there are no duplicate engine numbers--so long as there is sufficient information to properly identify the locomotive.

(d) The instructions shown on the approved form, or "Locomotive Inspection Report," should not be varied from, nor should the form shown as Exhibit 9 be materially varied from. Additional items may be added to this form covering anything the railroad company may desire to have inspected.

(e) In road service the word "trip" as used in this rule is held to mean one way over a division or district. On branch or turn-round runs where one trip is made in a day, "trip" will be held to mean "round trip."

(f) In suburban, transfer, or short branch-line service where more than one round trip is made each day, also in yard service, "day's work" (instead of trip) will apply.

(g) For locomotives which make one or more round trips per day with one end of the run a shop point, inspections made daily at such point will be accepted as meeting the requirements of the rule, even through the day's work is not completed there.

(h) In work-train or other service where locomotives are temporarily tied up at outlying points where repairs can not be made, inspection reports may be sent to the terminal at which the locomotive is cared for.

(i) For double-crew locomotives in yard service where crews change in the yard, one inspection and report each 24-hour period are required. This may be made when the locomotive is taken in for fuel, water, or fire cleaning. Where such locomotives do not go to the shop for this, an inspection period must be provided and the inspection, as provided by rule, made at last once each 24 hours.

(j) The number of inspections and reports required by the rule are minimum requirements and the above explanations are not intended in any way as modifications.

Defect Codes

230.104 Daily inspection.

ASH PANS

Regulation:

§230.105 Ash pans

(a) Ash pans shall be securely supported and maintained in safe and suitable condition for service.

(b) Locomotive built after January 1, 1916, shall have ash pans supported from mud rings or frames. Locomotives built prior to January 1, 1916, which do not have the ash pans supported from mud rings or frames shall be changed when the locomotive receives new fire box.

(c) The operating mechanism of all ash pans shall be so arranged that it may be safely operated and maintained in safe and suitable condition for service.

(d) No part of ash pan shall be less than 2 1/2 inches above the rail.

Defect Codes

230.105 Ash pans.

BRAKE AND SIGNAL EQUIPMENT

Regulation:

§230.106 Safe condition

(a) It must be known before each trip that the brakes on locomotive and tender are in safe and suitable condition for service; that the air compressor or compressors are in condition to provide an ample supply of air for the service in which the locomotive is put; that the devices for regulating all pressures are properly performing their functions; that the brake valves work properly in all positions; and that the water has been drained from the air brake system.

(b) Each steam road locomotive built on or after March 1, 1946, shall be equipped with a brake pipe valve attached to the front of the tender or on the rear of the back cab wall to enable the brakes to be applied in the event the occupants of the cab are, from any cause, prevented from applying the brakes in the usual manner. On locomotives having vestibule cabs the brake pipe valve shall be located adjacent to an exit. The words, "Emergency brake valve" shall be legibly stenciled on the cab near the brake pipe valve or shall be shown on a badge plate adjacent thereto. That each steam road locomotive built before March 1, 1946, shall be so equipped the first item said locomotive receives class 3[1] or heavier repairs after June 1, 1946.

[1] Flues all new or reset. (Superheater flues may be excepted.) Necessary repairs to firebox and boiler. Tires turned or new. General repairs to machinery and tender.
Defect Codes

230.106 Brake and signal equipment in safe condition.

Regulation:

§230.107 Compressors.

(a) The compressor or compressors shall be tested for capacity by orifice test as often as conditions may require, but not less frequently than once each 3 months.

(b) The diameter or orifice, speed of compressor, and the air pressure to be maintained for compressors in common use are given in the following table:

Make	Size compressor	Single strokes per minute	Diameter of orifice	Air pressure maintained
			Inches	Pounds
Westinghouse 9 1/2	120	1	1 1/34	60
Do 11	100		3/16	60
Do 8 1/2 c.c	100		3/32	60

New York 2a 120		**5/33**	**60**
Do 6a 100		**1 3/34**	**60**
Do 5b 100		**1 5/34**	**60**

For diagram of orifice see Figure 14.
This table shall be used for altitudes to and including 1,000 feet. For altitudes over 1,000 feet the speed of compressor may be increased 5 single strokes per minute for each 1,000 feet increase in altitude.

Interpretation

Rule 107. (b) Regarding air compressors.--The minimum capacity of any compressor permitted in service should be approximately 80 per cent of the capacity of the compressor when new. The chief inspector has consented to accept the following efficiency test for the 8 1/2-inch 120-foot Westinghouse low-pressure cross-compound air compressor:

100 single strokes per minute;
Air pressure maintained, 60 pounds;
Orifice diameter, 15/64 inch;
The requirements of rules 106 and 107 to be otherwise complied with.

Defect Codes

230.107 Air compressors.

Regulation:

§230.108 Testing main reservoirs.

(a) Every main reservoir before being put into service, and at least once each 12 months thereafter, shall be subjected to hydrostatic pressure not less than 25 percent above the maximum allowed air pressure.

(b) The entire surface of the reservoir shall be hammer tested each time the locomotive is shopped for general repairs, but not less frequently than once each 18 months.

Interpretation

Rule 108. (a) Testing main reservoirs.--Hydrostatic test should be applied to the main reservoir at the same time the hydrostatic test is applied to the boiler. For locomotives stored for one or more full calendar months, this test will be due after 12 calendar months' service, provided such service is performed within 24 consecutive months. Portions of calendar months out of service

will not be counted. Timeout of service must be properly accounted for by out-of-service reports filed with the United States inspector and notations of months claimed out of service made on the back of teach subsequent inspection report and cab card.

(b) Testing main reservoirs.--Hammer test of main reservoirs will be due after 18 calendar months' service, provided such service is performed within 24 consecutive months. Portions of calendar months out of service will not be counted. Timeout of service must be properly accounted for by out-of-service reports filed with the United States inspector and notations of months claimed out of service made on the back of each subsequent inspection report and cab card.

Defect Codes

230.108 Testing main reservoirs.

Regulation:

§230.109 Air gauges.

(a) Air gauges shall be so located that they may be conveniently read by the engineer from his usual position in the cab. Air gauges shall be tested at least once each 3 months, and also when any irregularity is reported.

(b) Air gauges shall be compared with an accurate test gauge or dead weight tester, and gauges found incorrect shall be repaired before they are returned to service.

Defect Codes

230.109 Air gauges.

Regulation:

§230.110 Time of cleaning.

Distributing or control valves, reducing valves, triple valves, straight-air double-check valves, and dirt collectors shall be cleaned as often as conditions require to maintain them in a safe and suitable condition for service, but not less frequently than once every 6 months.

Defect Codes

230.110 Time of cleaning air brake equipment.

Regulation:

§230.111 Stenciling dates of tests and cleaning.

(a) The date of testing or cleaning, and the initials of the shop or station at which the work is done, shall be legibly stenciled in a conspicuous lace on the parts,or placed on a card displayed under glass in the cab of the locomotive, or stamped on metal tags. When metal tags are used, the height of letters and figures shall be not less than three-eighths inch, and the tags located as follows:

(b) One securely attached to brake pipe near automatic brake valve, which will show the date on which the distributing valve, control valve or triple valves, reducing valves, straight-air double-check valves, dirt collectors, and brake cylinders were cleaned and cylinders lubricated.

(c) Once securely attached to air compressor steam pipe, which will show the date on which the compressor was tested by orifice test.

(d) One securely attached to the return pipe near main reservoir, which will show the date on which they hydrostatic test was applied to main reservoirs.

Defect Code

230.111 Stenciling dates of tests and cleaning.

Regulation:

§230.112 Piston travel.

(a) The minimum piston travel shall be sufficient to provide proper brake shoe clearance when the brakes are released.

(b) The maximum piston travel when locomotive is standing shall be as follows:

	Inches
Cam type of driving wheel brake	3 1/2
Other forms of driving wheel brake	6
Engine truck brake	8
Tender brake	9

Defect Codes

230.112 Piston travel.

Regulation:

§230.113 Foundation brake gear.

(a) Foundation brake gear shall be maintained in a safe and suitable condition for service. Levers, rods, brake beams, hangers, and pins shall be of ample strength, and shall not be fouled in any way which will affect the proper operation of the brake. All pins shall be properly secured in place with cotters, split keys, or nuts. Brake shoes must be properly applied and kept approximately in line with the tread of the wheel.

(b) No part of the foundation brake gear of the locomotive or tender shall be less than 2 1/2 inches above the rails.

Defect Codes

230.113 Foundation brake gear.

Regulation:

§230.114 Leakage.

(a) Main reservoir leakage; leakage from main reservoir and related piping shall not exceed an average of 3 pounds per minute in a test of 3 minutes' duration, made after the pressure has been reduced 40 percent below maximum pressure.

(b) Brake pipe leakage shall not exceed 5 pounds per minute.

(c) With a full service application from maximum brake pipe pressure, and with communication to the brake cylinders closed, the brakes on the locomotive and tender shall remain applied not less than 5 minutes.

Defect Codes

230.114 Leakage, air brake system.

Regulation:

§230.115 Train signal system.

The train signal system, when used, shall be tested and known to be in safe and suitable condition for service before each trip.

Defect Codes

230.115 Train signal system.

CABS, WARNING SIGNALS, AND SANDERS

Regulation:

§230.116 Cabs.

(a) General provisions. Cabs shall be securely attached or braced and maintained in a safe and suitable condition for service. Cab windows shall be so located and maintained that the enginemen may have a clear view of track and signals from their usual and proper positions in the cab.

(b) Clear vision windows. The front cab doors or windows of road locomotives used in regions where snow-storms are generally encountered shall be provided with what is known as a "clear vision" window, or an appliance that will clean the outside of such doors or windows over sufficient area to provide a clear view of track and signals ahead. If a "clear vision" window is used it shall be not less than 5 inches high located as nearly as possible in line of the engineman's vision and so constructed and fitted that it may be easily opened, closed and fastened in desired position.

(c) Steam pipes. Steam pipes shall not be fastened to the cab. On new construction or when renewals are made of iron or steel pipe subject to boiler pressure in cabs, it shall be what is commercially known as double strength pipe, with extra heavy valves and fittings.

(d) Cab back curtains. Each locomotive used within the State of Colorado, Connecticut, Delaware, District of Columbia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, Nevada,North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, Virginia, Washington and within that part of California north of an imaginary line drawn from Carson City, Nev., through Placerville, Oroville and Gerber, Calif., to Trinidad, Calif., except deckless locomotives and locomotives equipped with a vestibule cab, shall have suitable doors, or a suitable roll or slide-back curtain of sufficient length and width to cover the opening in rear wall of cab. On locomotives not equipped with hood curtain the drop-back curtain if used in lieu of slide curtain shall be of sufficient width to cover the space between the side curtains.

(e) Cab side curtains. During the period from November 1 to April 1 each locomotive used within the territory specified in paragraph (d) of this section, and not equipped with a vestibule cab, shall have suitable side curtains at the gangway in addition to the curtain required by paragraph (d) of this section. Side curtains shall be of ample length and width, and be properly fitted and attached. Side curtains may be of the wide or narrow type. If wide side curtains extending from rear of cab back alongside of tender are used they shall extend at least 18 inches back of front of tender water legs and the tender handholds at

gangway shall be offset at the rear of as to permit the side curtains to extend alongside of tender inside of handholds and not interfere with free and unobstructed use of the handholds. Side curtains shall have a suitable stiffening rod or member at rear of curtain. If narrow side curtains extending from rear of cab to tender are used, they shall be so arranged that a closely fitting joint can readily be formed at the tender when desired. Side curtains shall be so arranged and maintained that they can readily be open, and shall be so arranged as not to interfere with free and unobstructed use of the handholds. Where apron or floor of tender at gangway does not extend full width of tender, side curtains shall be hung as nearly in line with the ends of the apron as it practicable and shall extend not less than 12 inches below apron to tender floor and have attached thereto a flap suitable for placing on apron or tender floor and adequate for closing opening between side curtains and apron or tender floor. Side curtains shall extend to as near cab roof as practicable.

(f) Cab hood curtains. (1) Each locomotive, except locomotives burning oil as fuel and locomotives equipped with a vestibule cab, used during the period from November 1 to April 1 within the territory specified in paragraph (d) of this section, excepting the States of Maryland, Virginia, Delaware, Kentucky, West Virginia, California, and the District of Columbia, shall have, in addition to the curtains required by paragraphs (d) and (e) of this section, a suitable hood curtain extending around cab overhang so arranged as to close the opening that would otherwise exist between cab overhang and top of tender and between top of side curtains and cab overhang.

(2) Deckless locomotives may have in lieu of the hood curtain a suitable roll curtain attached at or near rear of cab overhang and of sufficient width to cover the space between the side curtains. On coal-burning locomotives the roll curtain shall be so located and of sufficient length that it may be unrolled down in front of coal gates to within 15 inches of floor of tender. The roll curtain shall be so arranged that it may be rolled up to top of tender water legs or to its supporting member and fastened in either position when desired.

(3) The requirements of this paragraph shall not apply on locomotives used on lines operating south of the territory outlined therein and extending into the territory of or a distance of not more than 15 miles.

(g) Unnecessary openings in cab. Unnecessary or excessive openings in locomotive cabs around reverse levers, grate-shaker levers, pipes, rods, running boards, doors, windows, between cab and boiler around wind sheets, or at any other place in cab or deck where rain, snow, or wind may enter shall not exist on any locomotive used during the period from November 1 to April 1 within the territory specified in paragraph (d) of this section.

(h) Oil-burning locomotives. (1) Oil-burning locomotives taking air for combustion through fire-door opening, used during the period from November 1 to April 1 within the territory specified in paragraph (d) of this section, shall have a suitable conduct extending from fire-door intake to outside of cab which will prevent air being drawn into firebox for the interior of cab. This requirement is not intended to prohibit the peephole or the opening

used for sanding provided the latter is provided with a suitable covers.

(2) The requirements of this paragraph shall be effective November 1, 1929, except on new locomotives or those out of service 15 or more consecutive days for repairs before November 1, 1929, in which instances the requirements shall be effective on the date the locomotives are put in service.

(i) Cab storm windows. (1) Each locomotive used in road service within the territory specified in paragraph (d) of this section shall have attached to the window on right and left sides of cab, or to the right an left sides of cab, a suitable storm window. Storm windows shall be hinged and arranged so that they can be folded back and fastened when desired.

(2) Upon application to the Director, Bureau of Railroad Safety, exemptions from the requirements of this paragraph may be granted if upon investigation it is found that clearances will not permit safe operation of such locomotives when equipped with storm windows.

Interpretation

Rule 116. (a) Cabs.--(a) It is permissible to protect cab windows on second engine in double heading with a screen.

(b) Obstructions located in front of cab windows so as to destroy a clear view of track and singles when looking ahead through these windows will not be considered a proper compliance with this rule.

Rule 116. (b) Clear vision windows.--Clear vision windows, or the double front windows as required by the Board of Railway Commissioners for Canada in their General Order No. 131, should be applied to all locomotives operating north of a line drawn due east and west through Atlanta, Ga., Albuquerque, N. Mex., and Los Angeles, Calif. Clear-vision or double-glass windows will not be required south of this imaginary line.

Rule 116. (c) Radiators.--Steam heating radiators must not be fastened to the cab.

Defect Codes

230.116 Cabs.

Regulation:

§230.117 Cab aprons.

Cab aprons shall be of proper length and width to insure safety. Aprons must be securely

hinged, maintained in a safe and suitable condition of service, and roughened, or other provision made, to afford secure footing.

Interpretation

Rule 117. Cab aprons.--Records show many serious and fatal accident due to improperly designed, applied and maintained cab aprons. It is therefore construed that--

(a) The width of a cab apron should be such that there will be no danger of a main having his foot crushed when locomotive takes a curve.

(b) Cab apron should be of sufficient width that is will not drop between locomotive and tender, as to permit a person standing on it to fall between, when drawbar is disconnected and safety chains or safety bars taut.

(c) Cab aprons should be of sufficient length to approximately cover the space between locomotive and end sill of tender, or tender deck where tender deck is shorter than end sill.

Defect Codes

230.117 Cab aprons.

Regulation:

§230.118 Fire doors and mechanical stokers.

(a) Each locomotive shall have a mechanically operated fire door (or fire doors if more than one is used) so constructed and maintained that it may be operated by pressure of the foot on a pedal, or other suitable appliance, located on the floor of the cab or tender at a suitable distance from the fire door, so that it may be conveniently operated by the person firing the locomotive: Provided, That locomotives burning oil fuel may have in lieu of the mechanically operated fire door a hand-operated fire door of suitable construction and so arranged that it may be securely bolted in closed position while the locomotive is being used.

(b) Fire doors shall be maintained in a safe and suitable condition for service.

(c) All coal-burning steam locomotives which weigh on driving wheels 160,000 pounds or more to be used in fast or heavy passenger service, built on or after April 15, 1939, shall be equipped with a suitable type of mechanical stoker, and all coal-burning steam locomotives which weigh on driving wheels 175,000 pounds or more to be used in fast or heavy freight service, built on or after April 15, 1939, shall be equipped with suitable type of mechanical stoker and such stokers shall be properly maintained. Each railroad which operates coal-burning locomotives of the above weights shall file with the director as of

April 15, 1939, a list of all hand-fired coal-burning locomotives of the above weights built prior to April 15, 1939, which will in the future be used in fast or heavy service on its line, and mechanical stokers will be applied each 12-month period to not less than 20 percent of the total number so listed, and all locomotives included in said list shall be so equipped before April 15, 1944, and such stokers shall be properly maintained. For the present this order shall not apply to deckless locomotives equipped with two cabs, which are generally known as the "Mother Hubbard type," built prior to April 15, 1939.

Defect Codes

230.118 Fire doors and mechanical stokers.

Regulation:

§230.119 Cylinder cocks.

Necessary cylinder cocks, operative from cab of locomotive, shall be provided and maintained in a safe and suitable condition for service.

Defect Codes

230.119 Cylinder cocks.

Regulation

§230.120 Sanders.

Locomotives shall be equipped with proper standing apparatus, which shall be maintained in safe and suitable condition for service, and tested before each trip. Sand pipes must be securely fastened in line with the rails.

Interpretation

Rule 120. Sanders.--The words "in line with the rails" mean sand pipes fastened so that the sand will be deposited on the rails.

Defect Codes

230.120 Sanders.

Regulation:

§230.121 Whistle.

Each locomotive must be provided with a suitable steam whistle, so arranged that it may be conveniently operated by the engineer.

Defect Codes

230.121 Whistle.

DRAW GEAR AND DRAFT GEAR

Regulation:

§230.122 Draw gear between locomotive and tender.

(a) The draw gear between the locomotive and tender, together with the pins and fastenings, shall be maintained in safe and suitable condition for service. The pins and drawbar shall be removed and carefully examined for defects not less frequently than once each 3 months. Suitable means for securing the drawbar pins in place shall be provided. Inverted drawbar pins shall be held in place by plate or stirrup.

(b) Two or more safety bars or safety chains of ample strength shall be provided between locomotive and tender, maintained in safe and suitable condition for service, and inspected at the same time draw gear is inspected.

(c) Safety chains or safety bars shall be of the minimum length consistent with the curvature of the railroad on which the locomotive is operated.

(d) Lost motion between locomotives and tenders not equipped with spring buffers shall be kept to a minimum, and shall not exceed one-half inch.

(e) When spring buffers are used between locomotives and tender the spring shall be applied with not less than 3/4-inch compression, and shall at all times be under sufficient compression to keep the chafing faces in contact.

Interpretation

Rule 122. (a) Draw gear.--Drawbar and pins will be due for removal after three calendar months' service, provided such service is performed within 15 consecutive months. Portions of calendar months out of service will not be counted. Time out of service must be properly accounted for by out-of-service reports filed with the United States inspector and notations of months claimed out of service made on the back of each subsequent inspection report and cab card.

Rule 122. (b) Draw gear.--"Ample strength" for safety chains or safety bars means sufficient

strength to prevent separation of locomotive and tender if draw bar fails. The combined strength of safety chains and their fastenings should be not less than 50 per cent of the strength of the drawbar and its connections.

Defect Codes

230.122 Draw gear between locomotive and tender.

Regulation:

§230.123 Chafing irons.

Chafing irons of such radius as will permit proper curing shall be securely attached to locomotive and tender, and shall be maintained in condition to permit free movement laterally and vertically.

Defect Codes

230.123 Chafing irons.

Regulation:

§230.124 Draft gear.

Draft gear and attachments on locomotives and tenders shall be securely fastened, and maintained in safe and suitable condition for service.

Defect Codes

230.124 Draft gear.

DRIVING GEAR

Regulation:

§230.125 Crossheads.

Crossheads shall be maintained in a safe and suitable condition for service, with not more than 1/4-inch vertical or 5/26 inches lateral play between crossheads and guides.

Defect Codes

230.125 Crossheads.

Regulation:

§230.126 Guides.

Guides must be securely fastened and maintained in a safe and suitable condition for service.

Defect Codes

230.126 Guides.

Regulation:

§230.127 Pistons and piston rods.

(a) Pistons and piston rods shall be maintained in safe and suitable condition for service. Piston rods shall be carefully examined for cracks each time they are removed, and shall be renewed if found defective.

(b) All piston rods applied after January 1, 1916, shall have the date of application, original diameter, and kind of material legibly stamped on or near the end of rod.

Interpretation

Rule 127. (b) Pistons and piston rods.--See item (c), rule 133, and Interpretation (b) of rule 133.

Defect Codes

230.127 Pistons and piston rods.

Regulation:

§230.128 Rods, main and side.

(a) Cracked or defective main or side rods shall not be continued in service.

(b) Autogenous welding of broken or cracked main and side rods not permitted.

(c) Bearings and bushings shall so fit the rods as to be in a safe and suitable condition for service, and means be provided to prevent bushings turning in rod. Straps shall fit and be securely bolted to rods.

(d) The total amount of side motion of rods on crank pins shall not exceed one-fourth inch.

(e) Oil and grease cups shall be securely attached to rods, and grease cup plugs shall be equipped with suitable fastenings.

(f) Locomotives used in road service: The bore of main rod bearings shall not exceed pin diameters more than three thirty-seconds inch at front or back end. The total lost motion at both ends shall not exceed five thirty-seconds inch.

(g) The bore of side rod bearings shall not exceed pin diameters more than five thirty-seconds inch on main pin nor more than three-sixteenths inch on other pins.

(h) Locomotives used in yard service: The bore of main rod bearings shall not exceed pin diameters more than one-eighth inch at front end or five thirty-seconds inch at back end.

(i) The bore of side rod bearings shall not exceed pin diameter more than three-sixteenths inch.

Interpretation

Rule 128. (c) Rods, main and side.--Floating bushings need not be provided with means to prevent bushings from turning.

Rule 128. (e) Grease-cup plugs.--any means may be adopted for securing grease-cup plugs in place that will prevent them from being thrown out.

Defect Codes

Defect code Rods, main and side.

Lights

Regulation:

§230.129 Locomotives used in road service.

(a) Each locomotive used in road service between sunset and sunrise shall have a headlight which shall afford sufficient illumination to enable a person in the cab of such locomotive who possesses the usual visual capacity required of locomotive enginemen, to see in a clear atmosphere, a dark object as large as a man of average size standing at a distance of at least 800 feet ahead and in front of such headlight; and such headlight must be maintained in good condition.

(b) Each locomotive used in road service, which is regularly required to run backward for any portion of its trip, except to pickup a detached portion of its train, or in making terminal movements, shall have on its rear a headlight which shall meet the foregoing requirements.

(c) Such headlights shall be provided with a device whereby the light from same may be diminished in yards and at stations or when meeting trains.

Defect Codes

230.129 Locomotives used in road service.

Regulation:

§230.130 Classification lamps.

Each locomotive used in road service shall be provided with such classification lamps as may be required by the rules of the railroad company operating the locomotive. When such classification lamps are provided they shall be kept clean and maintained in safe and suitable condition for service.

Defect Codes

230.130 Classification lights.

Regulation:

§230.131 Locomotives used in yard service.

Each locomotive used in yard service between sunset and sunrise shall have two lights, one located on the front of the locomotive and one on the rear, each of which shall enable a person in the cab of the locomotive under the conditions, including visual capacity, set forth in §230.129, to see a dark object such as there described for a distance of at least 300 feet ahead and in front of such headlight; and such headlights must be maintained in good condition.

Defect Codes

230.131 Locomotive used in yard service.

Regulation:

§230.132 Cab lights.

Each locomotive used between sunset and sunrise shall have cab lamps which will provide sufficient illumination for the steam, air, and water gauges to enable the enginemen to make necessary and accurate readings from their usual and proper positions in the cab. These lights shall be so located and constructed that the light will shine only on those parts requiring illumination. Locomotives used in road service shall have an additional lamp conveniently located to enable the persons operating the locomotive to easily and accurately read train orders and time tables, and so constructed that it may be readily darkened or extinguished.

Defect Codes

230.132 Cab lights.

RUNNING GEAR

Regulation:

§230.133 Driving, trailing, and engine truck axles.

(a) Driving, trailing, and engine truck axles with any of the following defects shall not be continued in service:

(b) Bent axle; cut journals that cannot be made to run cool without turning; seamy journals in steel axles; transverse seams in iron axles, or any seams in iron axles causing journal to run hot, or unsafe on account of usage, accident, or derailment; driving, trailing, or engine truck axles ore than one-half inch under original diameter, except of locomotives having all driving axles of the same diameter, when other than main driving axles, may be worn three-fourths inch below the original diameter.

(c) The date applied, the original diameter of the journal, and the kind of material shall be legible stamped on one end of each driving axle, trailing truck axle, and engine truck axle applied after January 1, 1916.

Interpretation

Rule 133. Driving, trailing, and engine truck axles.--(a) Worn-down axles maybe turned down and used under lighter equipment. It is suggested, however, that such axles be thoroughly annealed before being further used under such circumstances.

(b) The following abbreviations may be used in stamping "kind of material" on driving, trailing, and engine truck axles, piston rods, and crack pins:

I..... Iron	Nkl..... Nickel
S..... Steel	Nik..... Nikrome

H.T.S..... Heat Treated Steel
Chr..... Chrome
Van..... Vanadium
Cof. Proc... Coffin Process
Cam. Spec... Cambria Special
Tay. I..... Taylor Iron

Defect Codes

230.133 Driving, tailing, and engine truck axles.

Regulation:

§230.134 Tender truck axles.

The minimum diameters of axles for various axle loads shall be as follows:

Axle load		Minimum diameter of journal	Minimum diameter of wheel seat	Minimum diameter of center
		Inches	Inches	Inches
50,000 pounds	5 1/2	7 3/8	6 7/16	
38,000 pounds	5		6 3/4	5 7/8
31,000 pounds	4 1/2	6 1/4	5 5/16	
22,000 pounds	3 3/4	5	4 3/8	
15,000 pounds	3 1/4	4 5/8	3 7/8	

Defect Codes

230.134 Tender trucks.

Regulation:

§230.135 Defects in tender truck axles.

(a) Tender truck axles with any of the following defects shall not be continued in service:

(b) Bent axle; cut journals that cannot be made to run cool without turning; seamy journals in steel axles, or transverse seams in journals of iron axles, or unsafe on account of usage, accident, or derailment; collars broken or worn to one-fourth inch or less in thickness; fillet in back shoulder worn out.

Defect Codes

230.135 Defects in tender truck axles.

Regulation:

§230.136 Crank pins.

(a) Crank pins shall be securely applied. Shimming or brick punching crank pins will not be allowed. All crank pins applied after January 1, 1916, shall have the date applied and kind of material used legibly stamped on end of pin.

(b) Crank pin collars and collar bolts shall be maintained in a safe and suitable condition for service.

Interpretations

Rule 136. (a) Crank pins.--See item (c), rule 133, and Interpretation (b) of rule 133.

Defect Codes

230.136 Crank pins

Regulation:

§230.137 Driving boxes.

Driving boxes shall be maintained in a safe and suitable condition for service. Broken and loose bearings shall be renewed. Not more than one shim may be used between box and bearing.

Defect Codes

230.137 Driving boxes.

Regulation:

§230.138 Driving box shoes and wedges.

Driving box shoes and wedges shall be maintained in a safety and suitable condition for service.

Defect Codes

230.138 Driving box shoes and wedges.

Regulation:

§230.139 Frames.

Frames, deck plates, tailpieces, pedestals, and suitable condition for service, and shall be cleaned and thoroughly inspected each time the locomotive is in shop for heavy repairs.

Interpretation:

Rule 139. Frames.--Broken frames properly patched or secured by clamps or other usually recognized means which prevent the frames from working will not be objected to.

Defect Codes

230.139 Frames.

Regulation:

§230.140 Lateral motion.

(a) The total lateral motion or play between the hubs of the wheels and the boxes on any pair of wheels shall not exceed the following limits:

	Inch
For engine truck wheels (trucks with swing centers)	1
For engine truck wheels (trucks with ridge centers)	1 1/2
For trailing truck wheels	1
For driving wheels (more than one pair) ...	3/4

(b) These limits may be increased on locomotives operating on track where the curvature exceeds 20 degrees when it can be shown that conditions require additional lateral motion.

(c) The lateral motion shall in all cases be kept with in such limits that the driving wheels, rods, or crank pins will not interfere with other parts of the locomotive.

Defect Codes

230.140 Lateral motion.

Regulation:

§230.141 Pilots

(a) Pilots shall be securely attached, properly braced, and maintained in a safe and suitable condition for service.

(b) The minimum clearance of pilot above the rail shall be 3 inches, and the maximum clearance 6 inches.

Interpretations:

Rule 141. (b) Pilots.--The minimum and maximum clearance above the rails should be measured on straight level track.

Defect Codes

230.141 Pilots.

Regulation:

§230.142 Spring rigging.

(a) Springs and equalizers shall be arranged to insure the proper distribution of weight to the various wheels of the locomotive, maintained approximately level and in a safe and suitable condition for service.

(b) Springs or spring rigging with any of the following defects shall be renewed or properly repaired:

(c) Top leaf broken or two leaves in top half of any three leaves in spring broken. (The long side of spring to be considered the top.)

(d) Springs with leaves working in band.

(e) Broken coil springs.

(f) Broken driving box saddle, equalizers, hanger, bolt, or pin.

Interpretation:

Rule 142. (a) Spring rigging.--Adjusting weights by shifting weights from one pair of wheels to another is permissible.

Rule 142. (c) Broken springs.--Broken springs not exceeding the requirements of the rule may be repaired by applying clips, providing the clips can be made to remain in place.

Defect Codes

230.142 Spring rigging.

Regulation:

§230.143 Truck; leading and trailing.

(a) Trucks shall be maintained in safe and suitable condition for service. Center plates shall fit properly, and the male center plate shall extend into the female center plate not less than three-fourths inch. All centering devices shall be properly maintained.

(b) A suitable safety chain shall be provided at each front corner of all four wheel engine trucks.

(c) All parts of trucks shall have sufficient clearance to prevent them form seriously interfering with any other part of the locomotive.

Defect Codes

230.143 Truck; leading and trailing.

Regulation:

§230.144 Wheels.

(a) Wheels shall be securely pressed on axles. Prick punching or shimming the wheel fit will not be permitted. The diameter of wheels on the same axle shall not vary more than three thirty-seconds inch.

(b) Wheels used on standard gauge track will be out of gauge if the inside gauge of flanges, measured on base line, is less than 53 inches or more than 53 3/8 inches.

(c) The distance back to back of flanges of wheels mounted on the same axle shall not vary more than one-fourth inch.

Defect Codes

230.144 Wheels.

Regulation:

§230.145 Defects in cast-iron or cast-steel wheels.

Cast-iron or cast-steel wheels with any of the following defects shall not be continued in service:

(a) Slid flat. When the flat spot is 2 1/2 inches or over in length, or if there are two or more adjoining spots each 2 inches or over in length.

(b) Broken or chipped flange. If the chip exceeds 1 1/2 inches in length and one-half inch in width.

(c) Broken rim. If the tread, measured from the flange at a point five-eighths inch above the tread, is less than 3 3/4 inches in width.

(d) Shelled out. Wheels with defective treads on account of cracks or shelled-out spots 2 1/2 inches or over, or so numerous as to endanger the safety of the wheel.

(e) Brake burn. Wheels having defective tread on account of cracks or shelling out due to heating.

(f) Seams. Seams 1/2-inch ling or over, at a distance of one-half inch or less from the throat of the flange, or seams 3 inches or more in length, if such seams are within the limits of 3 3/4 inches from the flange, measured at a point five-eighths inch from the tread.

(g) Worn flanges. Wheels on axles with journals 5 inches by 9 inches or over with flanges having flat vertical surfaces extending seven-eighths inch or more from the tread, or flanges 1 inch thick or less gauged at a point three-eighths inch above tread. Wheels on axles with journals less than 5 inches by 9 inches with flanges having flat vertical surfaces extending 1 inch or more from the tread, or flanges 15/16-inch thick or less, gauged at a point three-eighths inch above the tread.

(h) Tread worn hollow. If the tread is worn sufficiently hollow to render the flange or rim liable to breakage.

(i) Burst. If the wheel is cracked from the wheel fit outward.

(j) Cracks. Cracked tread, cracked plate, or one or more cracked brackets.

(k) Gauge. Wheels out of gauge.

(l) Loose. wheels loose on axle.

Note: **The determination of flat spots, worn flanges, and broken rims shall be made by a gauge as shown in figure 8, and its application to defective wheels as shown in figures 9, 10, 11, 12 and 13.**

Defect Codes

230.145 Defects in cast iron or cast steel wheels.

Regulation:

§230.146 Defects in forged steel or steel tired wheels.

Forged steel or steel tired wheels with any of the following defects shall not be continued in service.

(a) Loose wheels; loose, broke, or defective retaining rings or tires; broken or cracked hubs, plates, spokes, or bolts.

(b) Slid flat spot 2 1/2 inches or longer; or, if there are two or more adjoining spots, each 2 inches or longer.

(c) Defective tread on account of cracks or shelled out spots 2 1/2 inches or longer, or so numerous as to endanger the safety of the wheel.

(d) Broken flange.

(e) Flange worn to fifteen-sixteenths inch or less in thickness, gauged at a point three-eighths inch above the tread, or having flat vertical surface, 1 inch or more from tread; tread worn five-sixteenths inch; flange more than 1 1/2 inches from tread to top of flange, or thickness of tires or rims less than shown in figures 4, 5,6 and 7.

(f) Wheels out of gauge.

Interpretations:

Rule 146. (f) Thickness of rims.--Pending further investigation and advice forged steel wheels may be use din switch locomotive tender service one-fourth inch less in thickness through throat of flange and shown by Figure 7 of the Laws, Rules and Instructions for Inspection and Testing of Steam Locomotives and Tenders and their Appurtenances.

Defect Codes

230.146 Defects in forged steel or steel tired wheels.

Regulation:

§230.147 Driving and trailing wheels.

Driving and trailing wheel centers with divided rims shall be properly fitted with iron or steel filling blocks before the tires are applied, and such filing blocks shall be properly maintained. When shims are inserted between the tire and the wheel center, not more than two thicknesses of shims may be used, one of which must extend entirely around the wheel.

Interpretation:

Rule 147. Driving and trailing wheels.--The shim which extends entirely around the wheel may be in three or four pieces, providing they do not lap. Under no circumstances should there be more than two thicknesses of shim at any one point.

Defect Codes

230.147 Driving and trailing wheels.

Regulation:

§230.148 Driving wheel counterbalance.

Driving wheel counterbalance shall be maintained in a safe and suitable condition for service.

Defect Codes

230.148 Driving wheel counterbalance.

Regulation:

§230.149 Defects.

Driving and trailing wheels with any of the following defects shall not be continued in service:

(a) Driving or trailing wheel centers with three adjacent spokes or 25 percent of the spokes in wheel broken.

(b) Loose wheels; loose, broken, or defective tires or tire fastenings; broken or cracked hubs, or wheels out of gauge.

Interpretations:

Rule 149. (c) Driving and trailing wheel centers.--A cracked hub properly repaired or banded so as to hold hub from working is permissible.

Defect Codes

230.149 Driving and trailing wheel centers.

Regulation:

§230.150 Driving and trailing wheel tires.

(a) The minimum height of flange for driving or trailing wheel tires, measured from tread, shall be 1 inch for locomotive used in road service, except that on locomotives where construction will not permit the full height of flange on all drivers the minimum height of flange on one pair of driving wheels may be five-eights inch.

(b) The minimum height of flange for driving wheel tires,measured from tread, shall be seven-eighths inch for locomotives used in switching service.

(c) The maximum taper for tread of tire from throat of flange to outside of tire, for driving and trailing wheels for locomotives used in road service, shall be one-fourth inch, and for locomotives used in switching service five-sixteenths inch.

(d) The minimum width of tires for driving and trailing wheels of standard-gauge locomotive shall be 5 1/2 inches for flanged tires, and 6 inches for plain tires.

(e) The minimum width of tires for driving and trailing wheels of narrow-gauge locomotives shall be 5 inches for flanged tires and 5 1/2 inches for plain tires.

(f) When all tires are turned or new tires applied to driving and trailing wheels, the diameter of the wheels on the same axle, or in the same driving wheel base, shall not vary more than three-thirty-seconds inch. When a single tire is applied the diameter must not vary more than three thirty-seconds inch of the average diameter of the wheels in the driving wheel base to which they are applied.

(g) Driving and trailing wheel tires with any of the following defects shall not be continued in service:

(h) Slid flat spot 2 1/2 inches or more in length; flange fifteen-sixteenths inch or less in thickness, gauged at a point three-eighths inch above the tread; or having flat vertical surface 1 inch or more from tread; tread worn hollow five-sixteenths inch on locomotives used in road service, or three-eighths inch on locomotives used in switching service; flange

more than 1 1/2 inches from tread to top of flange. (See figures 1, 2 and 3.)

Note: The determination of flat spots and worn flanges shall be made by a gauge as shown in figure 8, and its application to defective tires as shown in figures 9, 10 and 11.

Defect Codes

230.150 Driving and trailing wheel tires.

Regulation:

§230.151 Minimum thickness for driving wheel and trailer tires on standard and narrow gauge locomotives.

When retaining rings are used, measurements for tires to be taken from the outside circumference of the ring, and the minimum thickness of tires may be as much below the limits specified above as the tires extend between the retaining rings, provided it does not reduce the thickness of the tire to less than 1 1/8 inches from the throat of flange to the counter bore for the retaining rings.

The minimum thickness for driving wheel tires shall be 1 inch for locomotives operated on track of 2-foot gauge.

Weight per axle (weight on drivers divided by number of pairs of driving wheels)	Diameter of wheel center	Minimum thickness, service limits	
		Inches	Inches
30,000 pounds and under	44 and under	1 1/4	1 1/2
	Over 44 to 50	1 5/16	1 3/16
	Over 50 to 56	1 3/8	1 1/4
	Over 56 to 62	1 7/16	11 /16
	Over 62 to 68	1 1/2	.....
	Over 68 to 74	1 5/16	.....
	Over 74	1 5/8	.....
Over 30,000 to 35,000 pounds	44 and under	1 5/16	1 3/16
	Over 44 to 50	1 3/8	1 1/4
	Over 50 to 56	1 7/16	5/16
	Over 56 to 62	1 1/2	1 3/8
	Over 62 to 68	1 5/16	.....

	Over 68 to 74 .. 1 5/8	.....
	Over 74 ..... 1 11/16	.....
Over 35,000 to 40,000 pounds .. 44 and under ... 1 3/8		1 1/4
	Over 44 to 50 .. 1 7/16	1 5/16
	Over 50 to 56 .. 1 1/3	1 3/8
	Over 56 to 62 .. 1 3/16	1 7/16
	Over 62 to 68 .. 1 5/8	.....
	Over 68 to 74 .. 1 11/16	.....
	Over 74 ..... 1 3/4	.....
Over 40,000 to 45,000 pounds .. 44 and under ... 1 7/16		1 5/16
	Over 44 to 50 .. 1 1/2	1 3/8
	Over 50 to 56 .. 1 5/16	1 7/16
	Over 56 to 62 .. 1 5/8	1 1/2
	Over 62 to 68 .. 1 11/16	.....
	Over 68 to 74 .. 1 3/4	.....
	Over 74 ..... 1 13/16	.....
Over 45,000 to 50,000 pounds .. 44 and under ... 1 1/2		1 3/8
	Over 44 to 50 .. 1 5/16	1 7/16
	Over 50 to 56 .. 1 5/8	1 1/2
	Over 56 to 62 .. 1 11/16	1 5/16
	Over 62 to 68 .. 1 3/4	.....
	Over 68 to 74 .. 1 13/16	.....
	Over 74 ..... 1 7/8	.....
Over 50,000 to 55,000 pounds .. 44 and under ... 1 5/16		1 7/16
	Over 44 to 50 .. 1 5/8	1 1/2
	Over 50 to 56 .. 1 11/16	1 2/16
	Over 56 to 62 .. 1 3/4	1 5/8
	Over 62 to 68 .. 1 15/16	.....
	Over 68 to 74 .. 1 7/8	.....
	Over 74 to 1 15/16	.....
Over 55,000 to 60,000 pounds .. 44 and under ... 1 5/8		1 1/2
	Over 44 to 50 .. 1 11/16	1 2/16
	Over 50 to 56 .. 1 3/4	1 5/8
	Over 56 to 62 .. 1 15/16	1 1/16
	Over 62 to 68 .. 1 7/8	.....
	Over 68 to 74 .. 1 15/16	.....
	Over 74 2	.....

Interpretation:

Rule 151. (a)(The weights in this table will be interpreted to be the total weight on all axles divided by the number of axles.

Defect Codes

230.151 Minimum thickness for driving wheel and trailer tires on standard and narrow gauge locomotives.

TENDERS

Regulation:

§230.152 Tender frames.

(a) Tender frames shall be maintained in a safe and suitable condition for service.

(b) The difference in height between the deck on the tender and the cab floor or deck on the locomotive shall not exceed 1 1/2 inches.

(c) The minimum width of the gangway between locomotive and tender, while standing on straight track, shall be 16 inches.

Defect Codes

230.152 Tender frames.

Regulation:

§230.153 Feed water tanks.

(a) Tanks shall be maintained free from leaks, and in safe and suitable condition for service. Suitable screens must be provided for tank wells or tank hose. Feed water tanks on road locomotives that take water en route, built on or after March 1, 1946, shall be equipped with a device whereby the height or quantity of water in the tender feed water tank may be ascertained from the cab or tender deck of the locomotive, which shall be properly maintained. That each steam road locomotive that takes water en route, built before March 1, 1946, shall be so equipped the first time said locomotive receives class 3[1] or heavier repairs after June 1, 1946.

(b) Not less frequently than once each month the interior of the tank shall be inspected and cleaned if necessary.

(c) Top of tender behind fuel space shall be kept clean, and means provided to carry off waste water. Suitable covers shall be provided for filling holes.

[1]Flues all new or reset. (Superheater flues may be excepted.) Necessary repairs to firebox and boiler. Tires turned or new. General repairs to machinery and tender.

Defect Codes

230.153 Feed water tanks.

Regulation:

§230.154 Oil tanks.

The oil tanks on oil burning locomotives shall be maintained free from leaks. An automatic safety cut-out valve, which may be operated by hand from inside and outside of cab, shall be provided for the oil supply pipe.

Defect Codes

230.154 Oil tanks.

Regulation:

§230.155 Tender trucks.

(a) Tender truck center plates shall be securely fastened, maintained in a safe and suitable condition for service, and provided with a center pin properly secured. When shims are used between truck center plates, the male center plate must extend into the female center plate not less than three-fourths inch.

(b) Truck bolsters shall be maintained approximately level.

(c) When tender trucks are equipped with safety chains, they shall be maintained in a safe and suitable condition for service.

(d) Side bearings shall be maintained in a safe and suitable condition for service.

(e) Friction side bearings shall not be run in contact.

(f) The maximum clearance of side bearings on rear truck shall be three-eighths inch, and if used on front truck three-fourths inch, when the spread of side bearings is 50 inches. When the spread of the side bearings is increased, the maximum clearance may be increased in proportion.

Interpretation:

Rule 155. (e) Tender trucks.--Friction side bearings will not be considered as in contact if you can see between them on either side.

Rule 155. (f) Tender trucks.--The maximum side bearing clearance on rear truck is three-eights

inch on each side and on front truck three-fourths inch on each side, when the spread of side bearings is 50 inches.

Defect Codes

230.155 Tender trucks.

THROTTLE AND REVERSING GEAR

Regulation:

§230.156 Throttles.

Throttles shall be maintained in safe and suitable condition for service, and efficient means provided to hold the throttle lever in any desired position.

Defect Codes

230.156 Throttles.

Regulation:

§230.157 Reverse gear.

Reverse gear, reverse levers, and quadrants shall be maintained in a safe and suitable condition for service. Reverse lever latch shall be so arranged that it can be easily disengaged, and provided with a spring which will keep it firmly seated in quadrant. Proper counterbalance shall be provided for the valve gear.

(a) All steam locomotives built on or after September 1, 1937, shall be equipped with a suitable type of power-operated reverse gear.

(b) All steam locomotives used in road service built prior to September 1, 1937, which weigh[2] on driving wheels 150,000 pounds or more, and all steam locomotives used in switching service, built prior to September 1, 1937, which weigh on driving wheels 130,000 pounds or more, which are equipped with manually operated reverse gear, shall have a suitable type of power-operated reverse gear substituted therefore the first time that said locomotives are given repairs defined by the United States Railroad Administration as class 1[3] or 2,[4] and all such steam locomotives shall be so equipped before September 1, 1942.

(c) Each steam locomotive used in road service, built on or after March 1, 1946, that has an air operated power reverse gear shall be equipped with a connection whereby such gear may be operated by steam or by an auxiliary supply of air in case of failure of the main reservoir air pressure. Each steam locomotive used in road service, built on or before

March 1, 1946, that has an air operated power reverse gear shall be so equipped the first time said locomotive receives a class 3[1] or heavier repair after June 1, 1946. If an independent air reservoir is used as the source
of auxiliary supply of the reverse gear, it shall be provided with means to automatically prevent loss of pressure in event of failure of the main reservoir air pressure.

(d) When steam connections to air operated power reverse gear are used, the operating valve handle shall be conveniently located in the cab of the locomotive and so arranged and maintained that in case of air failure steam may be quickly used to operate the reverse gear. The operating rod or lever shall be plainly marked and equipped with a handle or wheel of a distinctive design.

Interpretation:

Rule 157. Reversing gar.--Counterbalance springs will not be required if the reversing gear can be handled properly without it.

Defect Codes

230.157 Reverse gear.

Regulation:

§230.158 Modification of rules.

Upon application to the Director, Bureau of Railroad Safety, modification of the rules in this subpart not inconsistent with their purpose, may be made for roads operating less than five locomotives, if an investigation shows that conditions warrant it.

Defect Codes

230.158 Modification of rules.

FILING REPORTS

Regulation:

§230.159 Report of inspection.

Not less than once each month and within 10 days after inspection a report of inspection, Form No.1 (§230.51), size 6 by 9 inches, shall be filed with the United States inspector in charge for each locomotive used by a railroad company, and a copy shall be filed in the office of the chief mechanical officer having charge of the locomotive.

Interpretation
(See interpretation for Rule 51.)

Regulation:

§230.160 Posting of copy.

A copy of the monthly inspection report, Form No. 1 (§230.51), or annual inspection report, Form No. 3 (§230.53)[5] properly filled out, shall be placed under glass in a conspicuous place in the cab before the locomotive inspected is put into service.

§230.161 Annual report.

Not less than once each year, and within 10 days after required tests have been completed, a report of such tests, showing general condition of the locomotive, shall be submitted on Form No. 3 (§230.53),[5] six 6 by 9 inches, and filed with the Untied States inspector in charge, and a copy shall be filed in the office of the chief mechanical officer having charge of the locomotive. The monthly report will not be required for the month in which this report is filed.

Interpretation:
(See interpretation for Rule 53.)

Note: Samples of Forms Nos. 1 and 3, indicating exact size, color, weight, and grade of paper, will be furnished on application.

[5] Form No. 3 should be printed on yellow paper.

Regulation:

§230.162 Accident reports.

In the case of an accident due to failure, from any cause, of a steam locomotive or tender, or any part or appurtenance thereof, resulting in serious injury or death to one or more persons, the carrier on whose line the accident occurred shall immediately report he accident by toll free telephone, Area Code 800-424-0201. The report shall state the nature of the accident, the number of persons killed or seriously injured, the place at which it occurred, as well as where the locomotive or tender may be inspected. Confirmation of this report shall be immediately mailed to the Associate Administrator for Safety, Federal Railroad Administration, Washington, D.C. 20590, and contain a detailed report of the accident, including to the extent known, the causes and a complete list of the killed or injured.

[41 FR 15848, Apr. 15, 1976]

INTERPRETATIONS, RULINGS, AND EXPLANATIONS ON QUESTIONS RAISED REGARDING THE LAWS, RULES, AND INSTRUCTIONS FOR INSPECTION AND TESTING OF STEAM LOCOMOTIVES AND TENDERS AND THEIR APPURTENANCES

INTERPRETATIONS, RULINGS, AND EXPLANATIONS

Rule 7. Rules for inspection. - "Officer in charge" means the officer indirect charge where inspections and repairs are made.

Rule 10. Flues to be removed.-(a) Regarding "Extension of time."

If an extension of time is desired, each locomotive should be taken up individually with the chief inspector approximately 60 days before the work becomes due, in order that a proper investigation may be made before the flues become delinquent. The decision reached will be based on conditions disclosed by the United States inspector covering each locomotive.

In each case the application should show-

1. Number of each locomotive for which the extension is desired.
2. Date boiler was built.
3. Date of previous removal of flues.
4. Mileage made since flues were removed and interior of boiler cleaned and inspected.
5. Class of service in which the locomotive is engaged.
6. Number of full calendar months claimed out of service.
7. Period of time for which the extension is desired.
8. Approximate date when it will be convenient to have the locomotive held and dome cap and throttle standpipe removed to permit an interior inspection by a United States inspector.
9. Point at which locomotive will beheld for inspection.

(b) For locomotives stored for one or more full calendar months, removal of flues will be due after 48 calendar months' service,providing such service is performed within five consecutive years and the requirements of rule 10 are fully complied with.

(c) Locomotives removed from service when flues become due for removal, need not have the flues removed until just prior to being returned to service.

(d) The removal of super heater flues every four years will not be required provided the flues are in good condition and the boiler can be thoroughly cleaned and inspected without their removal. This modification is subject to withdrawal if carriers permit defective or unserviceable superheater flues to remain in service.

Rule 16. Lagging to be removed.-- For locomotives stored for one or more full calendar months, jacket and lagging will be due for removal after 60 calendar months' service, provided such service is performed within six consecutive years. Portions of calendar months out of service will not be counted. Time out of service must be properly accounted for by out of service reports filed with the United States inspector and notations of months claimed out of service made on the back of each subsequent inspection report and cab card.

Rule 17. Time of testing boiler.(a)--The words "before being put into service" refer to new locomotives before entering service the first time; after that, hydrostatic testing should be made every 12 months.

(b) When locomotive is taken into shop for new fire box or new flues a hydrostatic test should be applied before the locomotive is put in service, in accordance with rule 17, even through the hydrostatic test may not be due until some later date and an annual locomotive inspection and repair report field covering the locomotive.

(c) It has been agreed to accept as the date of the hydrostatic test the date on which the inspection has been completed and the locomotive is ready for service.

(d) For locomotives stored for one or more full calendar months, hydrostatic tests will be due after 12 calendar months' service, provided such service is performed within 24 consecutive months. Portions of calendar months out of service will not be counted. Time out of service must be properly accounted for by out-of-service reports filed with the United States inspector and notations of months claimed out of service made on the back of each subsequent inspection report and cab card.

(e) A locomotive stored when hydrostatic test becomes due need not be given such test until immediately prior to its being returned to service.

(f) When the working pressure of any boiler is in creased above that shown on the specification card or previous annual locomotive inspection and repair report, the boiler must be subject to hydrostatic pressure 25 per cent above the increased pressure ,and an annual locomotive inspection and repair report filed, covering the hydrostatic test,and an alteration report field, as required by rule 54, covering the increased pressure.

Rule 18. Removal of dome cap.--(a) The fact that a locomotive is new does not relieve from

removing dome cap and throttle standpipe in accordance with rule 18 when the hydrostatic test is applied. It will therefore be necessary to remove the dome cap and throttle standpipe,in accordance with rule 18 and file report showing that the work has been done. (See Exhibit 2, item 11.)

(b) It is considered the better practice and is recommended that the dome cap be removed after hydrostatic test, in order to permit a thorough interior inspection after such test; but not instructions have been issued which conflict in any way with this rule. (See Exhibit 2,item 11.)

(c) Where the boiler is equipped with an auxiliary dome or inspection manhole,the dome ca and throttle standpipe need not be removed. Where the boiler is entered through auxiliary dome or inspection manhole, notation should be made on the margin of the report "Boiler entered through auxiliary dome."

Rule 21. Time of testing rigid bolts.--(a) Stay bolts must be tested at least once each calendar month or every 30 days as nearly as operating conditions will permit on all locomotives in service. No objection, however, will be taken by the Bureau of Locomotive Inspection if the 30-day period is not exceeded b more than five days when conditions fully justify.

(b) The practice of making a stay-bolt inspection during the first part of one month and a second test during the latter part of the following month, allowing the period between inspections to materially exceed 30 days, is not considered a proper compliance with this rule, nor with the intent and purpose thereof.

(c) All required inspections and tests falling due at the monthly period should be made while the locomotive is out of service for monthly inspection. The date of the monthly locomotive inspection and repair report should be the date on which the work is completed and the locomotive made ready for service.

(d) If stay bolts which are behind brickwork or behind grate bearers have a telltale hole three-six-tenths inch in diameter their entire length which is kept open at all times, the removal of the brickwork or grate bearers each month for the purpose of hammer testing such bolts will not be required. This will not, however, relive from making a thorough inspection when the brickwork is removed, nor will it relieve from removing the brickwork for an inspection whenever a United States inspector or the railroad company's inspector considered it desirable or necessary.

Rule 23. Method of testing flexible stay bolts with caps.--(a) When locomotives are stored for one or more full calendar months, the removal of flexible stay-bolts caps for the purpose of inspection will be due after 24 calendar months' service, provided such service is performed within three consecutive years. Portions of calendar months out of service will not be counted. time out of service must be properly accounted for by out-of-service reports filed with the United States inspector and notations of months claimed out of service made on the back of each subsequent inspection report and cab card.

(b) A locomotive stored when flexible stay-bolt cap removals are due need not be given such test until immediately prior to being returned to service.

(c) When locomotives are being given their annual inspection and test, flexible stay-bolt caps should be removed at the time of making this inspection, if they become due for removal before another annual inspection is due, and their removal shown on Form 3. One of the principal reasons urged for extending the time for removal of flexible stay-bolt caps from 18 months to 2 years was for the purpose of bringing the test due at every second annual inspection.

(d) If hollow flexible stay bolts with caps are tested with an electrical or other instrument approved by the Bureau of Locomotive Inspection as provided for in rule 23 (b) it is not required that caps be removed for test purposes, but the instrument test must be made each time the hydrostatic testis applied. (See rule 17 (d).)

Rule 24. Method of testing flexible stay bolts without caps.--A locomotive stored when test of flexible stay bolts without caps is due need not be given such test until immediately prior to its being returned to service.

Rule 25. Broken stay bolts.--(a) "Plugged" stay bolt means telltale hole has been plugged or riveted over or telltale hole missing.

(b) Telltale holes leaking, plugged, riveted over, or missing will be counted as broken stay bolts.

Rule 26. Telltale holes.--(a) When telltale holes one-eighth inch in diameter were drilled in stay bolts applied before
July 1, 1911, they have been accepted, provided they were of proper depth and were kept open.

(b) The depth of telltale hole specified in the rule is the minimum depth. To service their intended purpose telltale holes should extend into the bolts beyond the usual point of breakage. Several fatal accidents have resulted from failures of reduced body stay bolts where the telltale holes did not extend beyond the root of the fillet.

Rule 27. All stay bolts behind frame and braces should be drilled when the boiler is taken from its frame, or at the first opportunity that the bolts are available for drilling.

Rule 31. Method of testing steam gauges.--At points where monthly or annual inspections and tests are required to be made a dead-weight tester should be supplied. Where test gauges are used, it must be known that the test gauges are used, it must be known that the test gauge is accurate when comparisons are made; when testing steam gauges, they should be removed from the boiler. Comparison with a second gauge attached to the boiler under pressure is not considered safe and proper practice.

Rule 33. Boiler number.--(a) The builder's number if known, should be stamped on the dome

with figures at least three-eighths of an inch high, preceded by the builder's name or initials, as "Baldwin No. 000." If builder's number is unknown, the assigned number should be stamped on the dome, preceded by the name or initials of the railroad, as "B. & O. No. 000." Boiler numbers once recorded on specification cards can not thereafter be changed.

(b) In either case the number and initials should be stamped horizontally on the front side of dome right near the top.

(c) If a pressed-steel dome is used,the number and initials should be stamped horizontally on the front side of the dome at the upper edge of the vertical surface.

(d) No objection has been made to the location of the number stamped on the dome where such work was done previous to the item a standard location was decided upon.

(e) Numbers which are stamped after January 10, 1912, however, should be in the proper location. Only the minimum size of the figures has been fixed.

Rule 38. Water-glass valves.--No particular type of valve is required for water glasses or drain cocks, but such valves must be kept tight, and must be so constructed that they can be kept clean and open and so located and maintained that hey can be easily opened and closed by hand, extension handles being provided if necessary.

Rule 39. Time of cleaning.--Parts of water columns and connections where scale or sediment is liable to accumulate should be thoroughly cleaned each time gauge cocks and water-glass cocks are cleaned.

Rule 41. Water and lubricator glass shield.--(a) Since July 1, 1911, the effective date of the locomotive boiler inspection law, a great number of accidents have been reported growing out of burst water and lubricator glasses. In an effort to effect a diminution of water and lubricator glass accidents, instructions have been issued to all Government inspectors to remove from service all locomotives which are not equipped with water and lubricator glass shields in accordance with the rules.

(b) As practically all water-glass shields are patented, this bureau can not undertake to approve any particular style or shield.

(c) A spiral used as a shield is not considered a satisfactory compliance with rule 41.

(d) Shields of wire mesh have been accepted, provided the wire used in their construction is allowed to run no coarser than eight meshes per inch.

(e) Water glasses and water-glass shields should be so located, constructed, and maintained that the enginemen can at all times have a clear and easy view of the water in the glass from their usual and proper positions in the cab.

Rule 43. Regarding injectors.--Injectors and long injector steam pipes should be securely braced so as to avoid vibration. Records show that many serious and fatal accidents have been caused by the failure of injector steam pipes and connections.

Rule 44. Flue plugs.--If a plug is driven in, regardless of size of hole in it, it will have to be removed in accordance with rule 44. if plug is rolled and pressured, it is constructed as a thimble and no objection will be interposed to its use at present, providing the number applied are not excessive. The use of flue thimbles, however, is not considered good practice.

Rule 45. Time of washing boilers.--(a) All water changes have not been considered as washouts, and no objection has been made to the removal of the plugs in the water legs to facilitate the emptying of the boiler, however, where all plugs in water legs and back head plugs or plugs in the barrel of the boiler are removed and hose used, it is considered a washout, and it is insisted that all plugs be removed and the boiler properly washed.

(b) The removal of all plugs and a thorough washing of the boiler is also insisted on as often as water conditions require. It is not a compliance with this rule to remove all plugs once each month where water conditions require a more frequent washing. All plugs must be removed each time the boiler is washed. Experience has demonstrated that it is just as important to get all the soluble matter which causes foaming out of the boiler as it is to get out the incrusting solids.

Rule 46. Plugs to be removed.--The rules require that all washout plugs must be removed. We find that some roads claim that was out plugs are inspection plugs; but all inspection plugs should be considered as washout plugs, as they were put in the boiler of the purpose of washing the boiler and inspecting the boiler during the washing of the same.

Rule 47. Water tubes.--Arch and water bar tubes should be thoroughly cleaned with a mechanical cleaner each time the boiler is washed; it is insisted that they be thoroughly cleaned in the manner at each monthly and annual inspection. Arch or water bar tubes found defective, blistered, or bulged should be removed.

Rule 51. Monthly locomotive inspection and repair report.--(See Interpretations of rule 159.)

Rule 53. Annual locomotive inspection and repair report.--(See Interpretations of rule 161.)

Rule 54. (a) Specification card.--(a) A specification card is required for the boiler of each locomotive used, or permitted to be used, on the line of a carrier.

(b) If builder's number of boiler is unknown, a number should be assigned to the boiler, and the item "Builder's No. of Boiler" on specification card should be changed to "Assigned No. of Boiler." This assigned number should also appear in affidavit. The builder's number of the boiler must be used wherever it is known.

(c) Where a boiler is changed from one locomotive to another, such change must be promptly reported, giving the locomotive numbers and boiler numbers involved. When boilers are removed from locomotives, their disposition must be shown. Boiler numbers once recorded on specification cards can not thereafter be changed.

Rule 54. (b) Alteration reports.--(a) An accurate description of alterations should be made. Drawings of patches should show whether the plate underneath patches was removed, the location and extent of cracks, pitting,corrosion,a nd grooving should be shown and dimensioned if the defective plate was not removed, the size of rivets and the size of rivet holes should be given, and the reports should state whether iron or steel rivets were used. If authentic records of tests of material used in making reports are available the lowest tensile strength as shown by test should be given; otherwise 50,000 pounds for steel and 45,000 pounds for wrought iron will be allowed as provided by rule 4. it is not necessary to report patches on surfaces supported by stay bolts.

(b) Initials installations and removals of thermic syphons should be reported. Reports filed to cover initial installations should show the number of syphons installed, the construction of the device, the manner of application, and the manner in which the fire-box sheets are stayed in the immediate vicinity of the syphons.

(c) Initial installations and removals of low-water alarms should be reported. Reports filed to cover initial installation should show the trade name of the device and the manner of application.

Rule 55. Accident reports.--(See Interpretations of rule 162.)

Rule 104. Daily inspection.--(a) Any competent employee can be designated as an inspector.

(b) At terminals where roundhouse foreman or general foreman is unable to approve reports on account of lack of personal knowledge, the reports may be approved by a gang foreman who has direct knowledge that the work has been done. The person, however, approving the report must be one with responsibility.

(c) The initials o the road need not appear, providing there are no duplicate engine numbers--so long as there is sufficient information to properly identify the locomotive.

(d) The instructions shown on the approved form, or "Locomotive Inspection Report," should not be varied from, nor should the form shown as Exhibit 9 be materially varied from. Additional items may be added to this form covering anything the railroad company may desire to have inspected.

(e) In road service the word "trip" as used in this rule is held to mean one way over a division or district. On branch or turn-round runs where one trip is made in a day, "trip" will be held to mean "round trip."

(f) In suburban, transfer, or short branch-line service where more than one round trip is made each day, also in yard service, "day's work" (instead of trip) will apply.

(g) For locomotives which make one or more round trips per day with one end of the run a shop point, inspections made daily at such point will be accepted as meeting the requirements of the rule, even through the day's work is not completed there.

(h) In work-train or other service where locomotives are temporarily tied up at outlying points where repairs can not be made, inspection reports may be sent to the terminal at which the locomotive is cared for.

(i) For double-crew locomotives in yard service where crews change in the yard, one inspection and report each 24-hour period are required. This may be made when the locomotive is taken in for fuel, water, or fire cleaning. Where such locomotives do not go to the shop for this, an inspection period must be provided and the inspection, as provided by rule, made at last once each 24 hours.

(j) The number of inspections and reports required by the rule are minimum requirements and the above explanations are not intended in any way as modifications.

Rule 107. (b) Regarding air compressors.--The minimum capacity of any compressor permitted in service should be approximately 80 per cent of the capacity of the compressor when new. The chief inspector has consented to accept the following efficiency test for the 8 1/2-inch 120-foot Westinghouse low-pressure cross-compound air compressor:

100 single strokes per minute;
Air pressure maintained, 60 pounds;
Orifice diameter, 15/64 inch;

The requirements of rules 106 and 107 to be otherwise complied with.

Rule 108. (a) Testing main reservoirs.--Hydrostatic test should be applied to the main reservoir at the same time the hydrostatic test is applied to the boiler. For locomotives stored for one or more full calendar months, this test will be due after 12 calendar months' service, provided such service is performed within 24 consecutive months. Portions of calendar months out of service will not be counted. Timeout of service must be properly accounted for by out-of-service reports filed with the United States inspector and notations of months claimed out of service made on the back of teach subsequent inspection report and cab card.

(b) Testing main reservoirs.--Hammer test of main reservoirs will be due after 18 calendar months' service, provided such service is performed within 24 consecutive months. Portions of calendar months out of service will not be counted. Timeout of service must be properly accounted for by out-of-service reports filed with the United States inspector and notations of months claimed out of service made on the back of each subsequent inspection report and cab card.

Rule 116. (a) Cabs.--(a) It is permissible to protect cab windows on second engine in double heading with a screen.

(b) Obstructions located in front of cab windows so as to destroy a clear view of track and singles when looking ahead through these windows will not be considered a proper compliance with this rule.

Rule 116. (b) Clear vision windows.--Clear vision windows, or the double front windows as required by the Board of Railway Commissioners for Canada in their General Order No. 131, should be applied to all locomotives operating north of a line drawn due east and west through Atlanta, Ga., Albuquerque, N. Mex., and Los Angeles, Calif. Clear-vision or double-glass windows will not be required south of this imaginary line.

Rule 116. (c) Radiators.--Steam heating radiators must not be fastened to the cab.

Rule 117. Cab aprons.--Records show many serious and fatal accident due to improperly designed, applied and maintained cab aprons. It is therefore construed that--

(a) The width of a cab apron should be such that there will be no danger of a main having his foot crushed when locomotive takes a curve.

(b) Cab apron should be of sufficient width that is will not drop between locomotive and tender, as to permit a person standing on it to fall between, when drawbar is disconnected and safety chains or safety bars taut.

(c) Cab aprons should be of sufficient length to approximately cover the space between locomotive and end sill of tender, or tender deck where tender deck is shorter than end sill.

Rule 120. Sanders.--The words "in line with the rails" mean sand pipes fastened so that the sand will be deposited on the rails.

Rule 122. (a) Draw gear.--Drawbar and pins will be due to removal after three calendar months' service, provided such service is performed within 15 consecutive months. Portions of calendar months out of service will not be counted. Time out of service must be properly accounted for by out-of-service reports filed with the United States inspector and notations of months claimed out of service made on the back of each subsequent inspection report and cab card.

Rule 122. (b) Draw gear.--"Ample strength" for safety chains or safety bars means sufficient strength to prevent separation of locomotive and tender if draw bar fails. The combined strength of safety chains and their fastenings should be not less than 50 per cent of the strength of the drawbar and its connections.

Rule 127. (b) Pistons and piston rods.--See item (c), rule 133, and Interpretation (b) of rule

133.

Rule 128. (c) Rods, main and side.--Floating bushings need not be provided with means to prevent bushings from turning.

Rule 128. (e) Grease-cup plugs.--any means may be adopted for securing grease-cup plugs in place that will prevent them from being thrown out.

Rule 133. Driving, trailing, and engine truck axles.--(a) Worn-down axles maybe turned down and used under lighter equipment. It is suggested, however, that such axles be thoroughly annealed before being further used under such circumstances.

(b) The following abbreviations may be used in stamping "kind of material" on driving, trailing, and engine truck axles, piston rods, and crack pins:

i..... Iron	Nkl..... Nickel
S..... Steel	Nik..... Nikrome
H.T.S..... Heat Treated Steel	Cof. Proc... Coffin Process
	Cam. Spec... Cambria Special
Chr..... Chrome	Tay. I..... Taylor Iron
Van..... Vanadium	

Rule 136. (a) Crank pins.--See item (c), rule 133, and Interpretation (b) of rule 133.

Rule 139. Frames.--Broken frames properly patched or secured by clamps or other usually recognized means which prevent the frames from working will not be objected to.

Rule 141. (b) Pilots.--The minimum and maximum clearance above the rails should be measured on straight level track.

Rule 142. (a) Spring rigging.--Adjusting weights by shifting weights from one pair of wheels to another is permissible.

Rule 142. (c) Broken springs.--Broken springs not exceeding the requirements of the rule may be repaired by applying clips, providing the clips can be made to remain in place.

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Rule 146. (f) Thickness of rims.--Pending further investigation and advice forged steel wheels may be use din switch locomotive tender service one-fourth inch less in thickness through throat of flange and shown by Figure 7 of the Laws, Rules and Instructions for Inspection and Testing of Steam Locomotives and Tenders and their Appurtenances.

Rule 147. Driving and trailing wheels.--The shim which extends entirely around the wheel may be in three or four pieces, providing they do not lap. Under no circumstances should there be

more than two thicknesses of shim at any one point.

Rule 149. (c) Driving and trailing wheel centers.--A cracked hub properly repaired or banded so as to hold hub from working is permissible.

Rule 151. (a)(The weights in this table will be interpreted to be the total weight on all axles divided by the number of axles.

Rule 155. (e) Tender trucks.--Friction side bearings will not be considered as in contact if you can see between them on either side.

Rule 155. (f) Tender trucks.--The maximum side bearing clearance on rear truck is three-eights inch on each side and on front truck three-fourths inch on each side, when the spread of side bearings is 50 inches.

Rule 157. Reversing gar.--Counterbalance springs will not be required if the reversing gear can be handled properly without it.

Rule 159. Monthly locomotive inspection and repair report.--(a) A monthly locomotive inspection and repair report must be filed at least one each calendar month for every locomotive in service and as nearly every 30 days as operating conditions will permit; except, no monthly report will be required for the month in which an annual report has been filed. No objection, however, will be taken by the Bureau of Locomotive Inspection if the 30-day period is not exceeded by more than five days when conditions fully justify. The practice of making an inspection during the first part of one month and a second inspection during the latter part of the following month, allowing a period between inspections to materially exceed the 30 days, is not considered a proper compliance with this rule nor with the intent and purpose thereof.

(b) All inspections and tests falling due at monthly periods should be made while the locomotives is out of service for this inspection.

(c) The date of the report should be the date on which the inspection and repairs are completed and locomotive made ready for service.

(d) When inspections are made at outlying points and the foreman in charge makes the inspections and repairs, in addition to certifying to the report, he may also sign as officer in charge, inasmuch as he is the one being held responsible.

(e) In subscribing to the reports any person authorized to administer an oath may do so.

(f) The report should be sworn to by the inspector or inspectors who make the inspections immediately after the inspections and repairs have been completed and the locomotive made ready for service. The officer in charge certifies to the correctness of the repair.

(g) If the railroads desire for their own protection to have the master mechanic sign the report in addition to the officer in charge, there is not objection to their doing so.

(h) It is not required that eh affidavit be executed on the reports filed in the railroad company's office.

(i) The reports must be filed with the United States inspector within 10 days after date of inspection.

(j) The matter of relieving the railroads from the payment of postage on reports is something over which the Bureau of Locomotive Inspection has no jurisdiction.

(k) When locomotives are used in stationary service, items on the monthly locomotive inspection and repair reports pertaining to the boiler and its appurtenances should be correctly answered. items pertaining to running gear, driving gear, tender, etc., may be answered by stating "Used in stationary service." So long as a locomotive remains on its wheels the boiler and its appurtenances should be tested and made to meet the requirements of the rules and a regulations and a report field, as required by rule 51.

(l) When the road number of a locomotive is changed, the first inspection and repair report rendered thereafter should show in the upper right-hand corner the old and new number.

"Old No. 000
New No. XXX"

Note.--See Exhibit 2, Instructions governing the preparation and handling of locomotive inspection and repair reports.

Rule 161. Annual locomotive inspection and repair report.--(a) An annual locomotive inspection and repair report should be filed at least once every 12 months. No objection, however, will be taken by the Bureau of Locomotive Inspection if the 12 month period is not exceeded by more than 10 days when conditions fully justify.

(b) All inspections and tests falling due at annual periods should be made while the locomotive is out of service for this inspection.

(c) The date of the report should be the date on which the inspection and repairs are completed and locomotive made ready for service.

(d) In subscribing to the reports, any person authorized to administer an oath may do so.

(e) The report should be sworn to by the inspector or inspector who made the inspections immediately after the inspection and repairs have been completed and the locomotive made ready

for service. The officer in charge certifies to the correctness of the report.

(f) If the railroads desire for their own protection to have the master mechanic sign the report in addition to the master mechanic sign the report in addition to the officer in charge, there is no objection to their doing so.

(g) It is not required that the affidavit be executed on the reports field in the railroad company's office.

(h) The reports must be field with United States inspector within 10 days after date of inspection.

(i) The matter of relieving the railroads from the payment of postage on reports is something over which the Bureau of Locomotive Inspection has no jurisdiction.

(j) When locomotives are used in stationary service, items on the annual locomotive inspection and repair reports pertaining to the boiler and its appurtenances should be correctly answered. Item pertaining to running gear, driving gear, tender, etc., may be answered by stating "Used in stationary service." So long as a locomotive remains on its wheels the boiler and its appurtenances should be tested and made to meet the requirements of the rules and regulations and a report filed, as required by rule 53.

(k) When the road number of a locomotive is changed, the first inspection and repair report rendered thereafter should show in the upper right-hand corner the old and new number:

"Old No. 000
New No. XXX"

Note.--See Exhibit 2, Instructions governing the preparation and handling of locomotive inspection and repair reports.

Rule 162. Accident reports.--(a) Any accident resulting from failure from any cause of a locomotive or tender, including the boiler, or any of their appurtenances, resulting in serious injury or death to one or more persons,should be immediately reported by wire to the Chief Inspector at his office in Washington, D.C. Attention is directed to section 8 of the locomotive boiler inspection act, as amended, which provides in part as follows:

* * * and where the locomotive is disabled to the extent that it can not be run by its own steam, the part or parts affected by said accident shall be preserved by said carrier intact so far as possible without hindrance or interference to traffic until after said inspection. * * *

(b) Regarding "seriousness of accidents before being necessary to report to Bureau of Locomotive Inspection":

(c) A serious injury is defined as an injury which presents an employe from performing his accustomed duties for more than 3 days in the aggregate during the 10 days immediately following the accident.

(d) A "serious injury to a person other than an employee" is defined: "An injury sufficient to incapacitate the injured person from following his customary vocation or mode of life for a period of more than one day." This rule applies also to employees classed as passengers or trespassers.

(e) Where injuries are of a lesser degree, they are not the subject of report.

Note.--See Exhibit 1.

(a) Regarding "Presence of representatives": In the interest of harmony representatives of the carriers are requested to be present wherever possible at all inspections and investigations.

(b) It is also suggested that the employee or his representative participate in the investigation of serous accidents where the employee is involved.

(c) The United States inspector can not make report to the carrier's representative when inspections or investigations are made in the absence of the carrier's representative.

INSPECTION OF BRAKE AND SIGNAL EQUIPMENT

In general, the method of inspection and tests necessary to determine if the brake equipment on the locomotive is in proper condition as required by the various rules should include the following details:

DAILY INSPECTION AT ROUNDHOUSE

Compressor.--It should first be known that the compressor has received an orifice test within the period prescribed by rule 107. If this has been done, the inspector should note when the compressor is started that the main reservoir pressure increases at about the normal rate; that the strokes are uniform,; that it is not pounding; that the air strainer is clean and in good condition,; that the piston rod packing is free from leakage; that the steam end, including steam cylinder valve chamber, etc., is not blowing; that the compressor and its pipe connections are free from leakage; that the drain cocks are operative and that necessary lubricating attachments are provided and in good condition.

Compressor governor.--It should be noted that the governor stops the compressor when the maximum air pressure has been obtained and permits it to start with a reduction in the air pressure of not to exceed 3 pounds; that the steam vent port is open; that the leakage at the vent is not excessive; that the governor and its pipe connections are free from leakage.

Brake valve.--See that brake valves function properly in each position, particularly nothing the following:

Release position.--In this position the warning port should blow and if brake pipe angle cock is opened there should be a heavy continuous blow from the hose, and main reservoir pressure should fall at a rapid rate.

Running position.--It should be noted that the pressure regulators maintain the main reservoir and brake pipe at the pressures required in the service to which the locomotive is assigned.

Holding position.--It should be noted by the brake cylinder gauge that the brakes do not release or cylinder pressure increase following an application.

Lap position.--It should be noted that the equalizing reservoir or brake pipe pressure does not increase and that the required maximum main reservoir pressure is obtained.

Service position.--It should be noted the equalizing piston lifts promptly after the movement of the brake valve handle to service position and seats promptly upon return to lap position; also that there is no leak from the brake-pipe exhaust prot and that this is provided with a proper fitting.

Emergency position.--It should be noted that the discharge from the brake valve is regular and that the emergency action is secured. With E.T. equipment see that the usual increase in brake-cylinder pressure over that obtained with a service application is obtained and that the safe valve on the distributing or control valve is blowing.

Independent or straight air brake valve.--It should be noted that the handle moves freely; that the brake can be applied and released the usual rate; that the handle spring will return the handle to proper position; that the reducing valve controls the cylinder pressure at the desired amount and that no leakage exists.

Draining.--Water or foreign matter should be drained from the main reservoir; also from other parts of the equipment which are provided with a drain, and in freezing whether drain the triple valves when necessary.

Gauges.--It should be noted that the air gauges have been tested within three months and are located where the may be conveniently read; that gauge glasses are tight and dials are readable; that the pipes are connected with the correct air volume, and that their is no leakage. With brakes charged to standard pressure and the automatic brake-valve handle in full release position,the gauge hands of the duplex air gauge should register within 3 pounds of the same pressure. If the gauge is found to register incorrectly, it should be properly tested and repaired before being place in service.

Date of tests and cleaning.--It should be noted that distributing or control valves, reducing

valves, triple valves, straight air double check valves, dirt collectors, and brake cylinders are in a safe and suitable condition for service; that they have been cleaned and lubricated as required, and that proper record thereof has been made in accordance with rule 111.

Piston travel.--A full service application of the brake should be made, and the piston travel measured to see that it does not exceed the limit fixed in rule 112.

Foundation brake gear.--It should be noted that the foundation brake gear is in a safe and suitable condition for service and that all parts of it are at least 2 1/2 inches above the rails; that all pins are properly secured in place with otters, split keys, or nuts; that brake shoes are securely attached, are approximately in line with the treads of the wheels, and are of sufficient thickness to safely complete a trip.

Main reservoir leakage test.--Charge main reservoir to maximum pressure and reduce it 40 per cent. Place automatic brake valve handle in lap position, cut out distributing valve, and see that leakage from main reservoir and related piping does not exceed 9 pounds in three minutes.

Brake-pipe leakage test.--make a 10 pound brake pipe reduction from standard pressure with automatic brake valve; then note the fall of pressure on the brake pipe or equalizing reservoir gauge. This leakage should not exceed 5 pounds per minute.

Brake cylinder leakage test.--With maximum brake-pipe pressure and standard piston travel make a full service application and close communications to brake cylinder. Brake shoes should be held against the wheels with force for at least five minutes.

Signal system.--Determine by inspection that the signal system is free from leakage and see that the air pressure is standard, and that when a reduction is made in the signal line the signal whistle responds promptly.

Quarterly orifice test of compressor.--First see that a leakage from main reservoir and related piping is not excessive. Place automatic brake valve in lap position, cut out distributing or control valve, apply test fitting with proper orifice disk for the compressor to be tested, charge main reservoir to 60 pounds, regulate the speed of the compressor with the steam throttle until pressure remains constant at 60 pounds, then count the signal strokes of the compressor per minute. (It test fitting is applied at rear tender, distributing or control valve need not be cut out and brake valve should be in full release position.)

Exhibit 1

TELEGRAPHIC REPORTS TO THE BUREAU OF LOCOMOTIVE INSPECTION

All accidents resulting from failure, from any cause or improper condition, of a locomotive or

tender, including the boiler or any of their appurtenances, resulting in serious injury or death to one or more persons should be reported by telegraph to the Chief Inspector of Locomotives at his office in Washington, D.C., in accordance with rules 55 and 162 of the Rules nd Instructions for Inspection and Testing of Steam Locomotives and Tenders and their Appurtenance.

"Death" is defined: "casualty causing the death of a person within 24 hours after the accident."

A "serious injury" is defined: "any injury which prevents an employee from performing his accustomed duties for more than 3 days in the aggregate during the 10 days immediately following the accident."

A "serious injury to a person other than an employee" is defined: "An injury sufficient to incapacitate the injured persons from following his customary vocation or made of like for a period of more than one day." This rule applies also to employees classed as passengers or trespassers.

Telegrams should be addressed:

John M. Hall
Interstate Commerce,
Washington.

The telegram should state:

Date of accident.
Place at which accident occurred.
Name of railroad.
Number of locomotive.
Nature of accident.
Number of persons killed or seriously injured.
Place where locomotive may be inspected or investigation made.

It will not be necessary to report by wire or by letter accidents caused by the failure of any part or appurtenance of the locomotive or tender, including the boiler to the

Bureau of Safety of the Interstate Commerce Commission, except derailments and collisions as provided in the "Accident reports act" approved May 6, 1910. The making of telegraphic or mail reports above described, either to the Bureau of Safety or to the Bureau of Locomotive Inspection, will not relieve the carriers from reporting such accidents as required by law in their monthly reports to the Bureau of Statistics of the Interstate Commerce Commission.

Note: In reality this method of reporting is obsolete. Report steam locomotive accidents as you would modern locomotive accidents.

Exhibit 2

INSTRUCTIONS GOVERNING THE PREPARATION AND HANDLING OF LOCOMOTIVE INSPECTION AND REPAIR REPORTS

MONTHLY REPORT, FORM NO. 1

(SEE EXHIBIT 3)

The month and year for which the report is filed should be inserted in the upper left-hand corner of report, and the number of the locomotive and the initials should be given in the upper right-hand corner. By the initial so the locomotives is meant the initial of the road owning (not operating) the locomotive, and not the class designation. The name of the company operating the locomotive should appear on the line at the top of the report; the initials of the company are not satisfactory. The locomotive number should be filled in on line 2 of the body of report and should correspond with that given in upper right-hand corner of report. The date and place that the inspection and repairs are made should be filled in on line 3 of body of report. The date should be the date on which repairs were completed.

Item 1 should show the date on which steam gauges were tested and left in good condition. Steam gauges should be tested immediately before the safety valves are set or any changes made in the setting.

Item 2 should show the pressure at which each safety valve is set to pop. If the locomotive is equipped with only two safety valves the space on report for the third safety valve should be filled in with the word "none." The date of the setting should be given.

Item 3 should be answered "Yes" or "No". Where locomotives are equipped with one injector and one feet-water pump instead of two injectors an asterisk (*) should be placed opposite questions 3 with a notation below the affidavit,or on the margin of the report: "(*) One injector and one feet-water pump." The answer to this question would then include the condition of both the injector and feed-water pump; the same as it two injectors were used.

Item 4 should be answered "Yes" or "No."

Note: This question refers to all steam leaks other than those existing in the boiler proper.

Item 5 requires two answers; first, showing conditions of brake equipment; second, showing condition of signal equipment. If signal equipment is not used the answer should be "Not used."

Item 6 required two answers, first, showing condition of draft gear; second,showing condition of draw gear. The month in which the drawbar and pins are removed and inspected should show, in addition to the two answers called for, "removed and inspect," which maybe placed

on the margin of the report if necessary.

Item 7 should show condition of driving gear.

Item 8 should show condition of running gear.

Item 9 should show condition of tender. When locomotives have saddle tanks and no tender this item should be answered "Not used." Note: This answer should cover all parts of tender not covered in items 5, 6 and 8.

Item 10 requires two answers, and should be answered "Yes" or "No."

Item 11 should be answered "Yes" or "No."
Note: This item refers to all steam leaks existing in the boiler proper.

Item 12 requires two answers; first, showing condition of stay bolts; second, showing condition of crown stays.

Item 13 requires two answers; first, showing number of stay bolts renewed; second, showing number of crown stays renewed.

Item 14 requires two answers; first, showing condition of flues; second, showing condition of fire box sheets.

Item 15 requires two answers; first, showing condition of arch tubes; second, showing condition of water-bar tubes. Where a fire box is equipped with thermic syphons and not with arch tubes, or syphons are used in connection with arch tubes, an asterisk (*) should be placed opposite question 15 with notation made below the affidavit, or on the margin of the report, "(*) (Give number) thermic syphons." The answer would then show the condition of the syphons, arch tubes, or arch tubes and syphons when both are used in the same fire box. When arch tubes, syphons, or water-bar tubes are not used, the answer should be "Not used."

Item 16: If boiler is equipped with fusible plugs answer should be "Yes" or "No." Where a low-water alarm is applied an asterisk (*) should be placed opposite question 16 with a notation made below the affidavit, or on the margin of the report, "(*) (Give name) low-water alarm." The answer to the question would then show the condition of the low-water alarm, fusible plug, or the condition of both the low water alarm and fusible plug, if both are used on the same locomotive. If the report does not bear the notation "low water alarm," it will indicate that a low water alarm is not applied to the locomotive for which the report is rendered. Where low water alarms use a fusible metal which comes in contact with the water, steam or flames of combustion, such parts us be given the same attention as the rules now require for fusible plugs, and a proper notation made on the report of inspection. Where other types of low water alarm are applied they should be inspected and tested at least once every month and their condition shown on the report of inspection. If neither fusible plug or low water alarm is use d the answer

should be "Not used."

Item 17: Date of previous hydrostatic test must be given.

Item 18: Date of removal of caps from flexible stay bolts must be given except that when all flexible stay bolts with which a boiler is equipped are of the type described in rule 23 (b) and these stay bolts are tested in the manner described there in it is not required that the caps be removed for test purposes and the answer should show the last date on which the telltale holes were opened and the stay bolts tested with an approved electrical or other instrument. For example, if the test was made February 1, 1929, the answer would be "23(b) February 1, 1929." If the boiler is not equipped with flexible stay bolts having caps the answer should be "Not used."

ANNUAL REPORT, FORM 3

The month and year for which report is filed should be inserted in the upper left hand corner of report and the number of the locomotive a initial should be given in the upper right hand corner. By the initials of the locomotive is meant the initials of the road owning (not operating) the locomotive, and not the class designation. The name of the company operating the locomotive should appear on the lien at the top of the report; the initial so the company are not satisfactory. The locomotive number should be filled in on line 2 of the body of the report and should correspond with that given in the upper right-hand corner or report. The date should be the date on which repairs were completed.

Item 1: Date of previously hydrostatic test must be given.

Item 2: Date of previous removal of caps from flexible stay bolts must be given except that when all flexible stay bolts with which a boiler is equipped are of the type described in rule 23 (b) and these stay bolts were test in the manner described there in the answer should show the previous date on which the telltale holes were opened and the stay bolts tested with an approved electrical or other instrument. For example; if the test was made February 1, 1929, the answer would be "23 (b) February 1, 1929." If the boiler is not equipped with flexible stay bolts having caps the answer should be "Not used."

Item 3: Date of previous removal of all flues must be given.

Item 4: Date of previous removal of all lagging from boiler must be given.

Item 5 should show the pressure applied when hydrostatic test was given.

Item 6 should be answered "Yes" or "No" except that when all flexible stay bolts with which a boiler is equipped are of the type described in rule 23 (b) and these stay bolts are tested in the manner described there in the answer should show that the caps were not removed and that the telltale holes were opened and the stay bolts tested with an approved electrical or other

instrument. For example: "No. 23 (b)." If the boiler is not equipped with flexible stay bolts having caps the answer should be "Not used."

Item 7 requires two answers; first, should be answered :Yes" or "No"; second, number of flues removed should be given. Note: If locomotive is equipped with superheater flues and same are not removed, but all of the small flues are removed, answer to the first question should then be "Yes, except superheater flues," which notation may be made on margin of report. When boiler is equipped with preheated flues, the date of removal of flues from boiler and preheated should be given separately.

Item 8 should give the condition of the interior of the barrel of boiler, if all flues a removed, or if a sufficient number of flues are removed to allow a thorough examination of the interior of the boiler. If such a number of flues are not removed, but the interior of the barrel above the flues is examined, this item should given the condition of the interior of the barrel above the flues. For example, "Good above flues."

item 9 should be answered "yes" or "no."

Item 10 should given the condition of the exterior of the boiler, if sufficient lagging is removed to permit a thorough inspection. If not, the answer should be "Not inspected."
Note: This inspection should be made while boiler is under pressure.

Item 11 should be answered "Yes" or "No."

Item 12 requires two answers, each of which should be answered "Yes" or "No."

Item 13 requires two answers; first, showing condition of crown stays; second,showing condition of stay bolts.

Item 14 requires two answers, first, showing condition of sling stays; second showing condition of crown bars as far as can be inspected.
Note: If boiler is not equipped with either sling stays or crown bars, the answer to either question should be "None used."

Item 15 requires two answers; first, showing condition of fire-box sheets; second, showing condition of flues. If a new fire box is applied the answer should be "New fire box."

Item 16 requires two answers; first, showing condition of arch tubes; second, showing condition of water-bar tubes. Where a fire box is equipped with thermic syphons and not with arch tubes, or syphons are used in conjunction with arch tubes, an asterisk (*) should be placed opposite question 10, with notation made below the affidavit, or on the margin of the report, "(*) (Give number) thermic syphons." The answer would then show the condition of the syphons, arch tubes, or arch tubes and syphons when both are used in the same fire box. When arch tubes, syphons, or water-bar tubes are not used answers should be "Not used."

Item 17 should give the condition of throat braces, if inspected. If they can not be inspected, the answer should be "Not inspected."

Item 18 should give the condition of back-head braces,whenever it is possible for these brackets to be inspected. If not inspected, the answer should be "Not inspected."

Item 19 should give the condition of front-flue sheet braces whenever it is possible for these braces to be inspected. If not inspected, the answer should be "Not inspected."

Item 20: If boiler is equipped with fusible plugs answer should be "Yes" or "No." Where a low water alarm is applied an asterisk (*) should be placed opposite question 20 with a notation made below the affidavit, or on the margin of the report, "(*) (Give name) low-water alarm." The answer to the question would then show the condition of the low-water alarms, fusible plug,or the conditions of both the low-water alarm and fusible plug, if both are used on the same locomotive. If the report does not bar the notation "low water alarm,: it will indicate that a low-water alarm is not applied to the locomotive for which the report is rendered. Where low-water alarms use a fusible metal which come in contact with the water, steam or flames of combustion, such parts must be given the same attention as the flues now require for fusible plugs, and proper notation made on the report of inspection. Where other types of low-water alarm are applied they should be inspected and tested at least once every month and their condition shown on the report of inspection. If neither fusible plug nor low-water alarm is used the answer should be "Not used."

Item 21 should be answered "Yes" or "No."
Note: This question refers to all steam leaks existing in the boiler proper.

Item 23 should be answered "Yes" or "No."

Item 23 should show the pressure at which each safety valve is set to pop. If locomotive is equipped with only two safety valves, space on report for their safety valve should be filled in with the word "None."

Item 24 should be answered "Yes" or "No." Where locomotives are equipped with one injector and one feed water pump instead of two injectors, an asterisk (*) should be placed opposite question 24 with a notation below the affidavit, or on the margin of the report: "(*) One injector and one feet water pump." The answer to this question would then include the condition of both the injector and feed water pump; the same as if two injectors were used.

Item 25 should be answered :Yes" or "No."
Note: This item refers to all steam leaks other than those existing in boiler proper.

Item 26 should show pressure applied to main reservoirs when hydrostatic tests were applied. When new reservoirs are applied for which a sworn report of hydrostatic test has been furnished by the builders, the test pressure should be followed by the words "Builder's test."

Item 27 requires two answers; first, showing condition of brake equipment; second, showing condition of signal equipment. If signal equipment is not used, the answer should be "Not used."

Item 28 should be answered "Yes" or "No."

Item 29 requires two answers; first, showing condition of draft gear; second, showing condition of draw gear.

Item 30 should show the condition of driving gear.

Item 31 should show the condition of running gear.

Item 32 should show the condition of tender.
Note: This item to cover all parts of tender not covered in items 27, 28, 29 and 31.

GENERAL INSTRUCTIONS APPLICABLE TO BOTH MONTHLY AND ANNUAL REPORTS

Forms 1 and 3

(a) The reports may be signed and certified but one or more inspectors. If one inspector has personal knowledge that all the work known on the report has been performed, he may so certify; otherwise, each inspector should sign, in which case each should indicate before his signature the number of the items to which he is certifying. For example:

Form No. 3 -- Items 1 to 11, John Smith
Items 12 to 21, William Johnson
Form No. 1 -- Items 1 to 5, John Smith
Items 6 to 9, Frank Jones

(b) Exhibits 3 and 5 show how reports should be made out when signed by one or more inspectors.

(c) The officer in charge must know that work has been properly done. If the master mechanic or general foreman has such knowledge, reports signed by him will be accepted, otherwise they should be signed by the foreman who is in direct charge of the work and has personal knowledge that it has been properly performed.

(d) Monthly and annual report should be sworn to before a notary public by the inspector making the inspection. The officer in charge certifies to the correctness of the reports.

(e) It is desired that the reports be filled in with typewriter, ink, or rubber stamp. While the use of indelible pencil is allowed, typewriter or ink is preferred.

(f) Reports which are sent in to take the place of ones previously filed but which were incorrect should bear the notation "Corrected report" at the top of the report, and should be forwarded to the Federal Inspector, unless otherwise advised.

(g) Such words as "Safe" and "O.K." should not appear in any answer to the items on either report. The answers should show the exact conditions found.

(h) Where the questions require the condition to be shown, the answer may be either "Good, "Fair" or "Bad," and the following definitions will apply to these terms:

Good: That part or parts have defects, which could be discovered by a reasonable inspection.

Fair: That the part or parts have defects, but are in safe and suitable condition, and not in violation of the rules.

Bad: That the part or parts are in violation of the rules.

(i) It is not required to have the affidavit executed on the report filed in the railroad company's office.

No monthly report, Form 1, will be required for the month in which an annual report, Form 3, has been made.

OUT OF SERVICE REPORT

(See Exhibit 4)

(a) Out of service reports may be filed for locomotives which are out of service for an entire calendar month, or are out of service when due for inspection and remain out for the balance of the month.

(b) When out of service report has been filed,an inspection must be made and report field before the locomotive is again returned to service.

(c) Out of service report should not be filed until the end of the month for which it is to cover. They need not be sworn to, but should be signed by the officer in charge.

(d) Where a locomotive is inspected, and regular inspection and repair report filed, but is held out of service (not under steam) for the entire month, an out of service report may be filed on the last day of the month, stating "Locomotive received regular inspection (give date) but rendered no service during the entire calendar month: and in such cases automatic extension as outlined in connection with interpretation of rules 10, 16, 17, 23, 108, and 122 will be allowed provided tie out of service is properly accounted for by notations on the back of each subsequent inspection and repair report and cab card.

FINAL REPORT

(See Exhibit 6)

(a) When a locomotive is permanently retired from service on account of having been condemned, scrapped, or sold, a final report, on Form 3, giving the locomotive number and the boiler number, should be filed with the Federal inspector. This report is to be certified to by the mechanical engineer or chief mechanical officer and when filed will close the record for the locomotive so reported and further reports need not be filed.

(b) If the boiler only is scrapped or otherwise disposed of and the locomotive continued in service with a new boiler, the report should show the number of the new boiler with the disposition and number of the old boiler.

(c) Where a boiler is changed from one locomotive to another, such change must be noted on the report, giving the locomotive numbers and boiler numbers involved.

INSTRUCTIONS FOR PREPARING FORM 19

Follow paragraph b, rule 54.
Describe accurately what alterations were made.
The location and extent of cracks, pitting, corrosion, and grooving must be shown and dimensioned unless the defective plate is removed.
Drawing must show whether the plate underneath patch was removed.
Report must state whether iron or steel rivets were used.
The size of rivet holes must be given as well as the size of the rivets.
If authentic records of the tests of materials used in making repair scan be obtained, the lowest tensile strength as shown by test must be given; otherwise 50,000 pounds for steel and 45,000 pounds for wrought iron will be allowed as provided by rule 4.
Incase of patches applied prior to July 9, 1914, if there is no authentic record of the date when or the shop where the alteration was made, insert the word "Unknown" in the proper blank spaces.
It is not necessary to report patches on surfaces supported by stay bolts.

SUMMARY OF
STEAM LOCOMOTIVE DEFECT CODES-PART 230

The results of steam locomotive inspections must be recorded on FRA Inspection Form F6180.59A. When recording the noncomplying conditions the following defect codes shall be used for entering each noncomplying concern or condition on the form. The complete description of the defect code is contained in the relevant and referenced sections of Part 230.

SUBPART A - BOILERS AND APPURTENANCES

230.001 Responsibility for General Construction and Safe Working Pressure of the Boiler

FACTOR OF SAFETY

230.002 Lowest Factor of Safety
230.003 Maximum Allowable Stress on Stays and Braces

STRENGTH OF MATERIALS

230.004 Tensile Strength of Shell Plates
230.005 Maximum Shearing Strength of Rivets
230.006 Higher Shearing Strength of Rivets

INSPECTION

230.007 Responsibility for Inspection and Repair
230.008 Term Inspector

INSPECTION OF INTERIOR OF BOILER

230.009 Time of Inspection
230.010 Flues to be Removed
230.011 Method of Inspection
230.012 Repairs
230.013 Lap-Joint Seams
230.014 Fusible Plugs

INSPECTION OF EXTERIOR OF BOILER

230.015 Time of Inspection
230.016 Lagging to be Removed

TESTING BOILERS

STAYBOLT TESTING

STEAM GAUGES

SAFETY VALVES

WATER GLASS AND GAUGE COCKS

INJECTORS AND FLUE PLUGS

WASHING BOILERS

STEAM LEAKS

FILING REPORTS

SUBPART B-STEAM LOCOMOTIVE AND TENDER

ASH PANS

BRAKES AND SIGNAL EQUIPMENT

CAB, WARNING SIGNALS, AND SANDERS

DRAW GEAR AND DRAFT GEAR

DRIVING GEAR

LIGHTS

RUNNING GEAR

TENDERS

THROTTLE AND REVERSING GEAR

FILING REPORTS

Appendix A

Reporting Forms

As an aid to Inspectors in the field, examples of the following FRA Reporting Forms are included in this Appendix:

Railroad Accident Notification FRA F 6180-41

Waivers Inspectors Report Form For MP&E Petitions (Chapter 5, page 5-14)

Report of Interview (Chapter 5, page 5-15)

Witness Statement (Chapter 5, page 5-16)

Notice to Individuals Regarding Violations of Federal Safety Acts and Regulations FRA 6180.80

Inspection Report FRA F 6180.59a (Chapter 5, page 5-7)

Locomotive Inspection and Repair Record FRA F 6180.49A

Special Notice for Repair FRA 6180-8 (Part 1) (Chapter 5, page 5-11)

Violation of Locomotive Inspection Act FRA F 6180.10

Railroad Freight Car Safety Standards

Violations Report FRA F 6180.68 (Chapter 5, page 5-7)

Violation Report Continuation FRA F 6180.68A

Violation Report Supplement FRA F 6180.69

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

RAILROAD ACCIDENT NOTIFICATION

1. SUBMITTED BY:		
2. DATE	3. TIME	
ME OF RAILROAD	5. LOCATION OF ACCIDENT	TIME AND DATE
6. METHOD OF OPERATION		

7. TRAIN INFORMATION

	TRAIN #1	TRAIN #2	TRAIN #3
A. KIND OF TRAIN			
B. TRAIN NUMBER			
C. DIRECTION			
D. NUMBER OF LOCOMOTIVE UNITS			
E. NUMBER OF CARS			
F. ESTIMATED SPEED			
G. EQUIPMENT DERAILED			

8. CASUALTIES

A. NUMBER KILLED	B. NUMBER SERIOUSLY INJURED	C. NUMBER SLIGHTLY INJURED

9. PROBABLE CAUSE OF ACCIDENT

10. HAZARDOUS MATERIAL CARS DERAILED OR SIGNIFICANTLY DAMAGED

CAR TYPE	INIT. AND NO.	CARGO	FIRE EXPLOSION, ETC.
A.			☐ YES ☐ NO
B.			☐ YES ☐ NO
C.			☐ YES ☐ NO

11. NUMBER CARS DERAILED OR DAMAGED	12. POPULATED AREA	13. EVACUATION?	14. NO. PEOPLE EVACUATED
	☐ YES ☐ NO	☐ YES ☐ NO	

15. RAIL-HIGHWAY CROSSING ACCIDENT? ☐ YES ☐ NO	16. CROSSING PROTECTION

17. TYPE OF MOTOR VEHICLE	18. CARGO	19. INTERSTATE ☐ YES ☐ NO

20. BRIEF DESCRIPTION OF ACCIDENT

Form FRA F 6180—41 (5-69)

WAIVERS-INSPECTORS' REPORT FORMS FOR MP&E PETITIONS

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
Inspectors Report Form for MP&E Petitions

Petition Number_____Date filed_____

From Inspector:_____Place_____Date_____

Railroad filing petition:_____

Inspection: Railroad Representative Name and Title_____
_____ Date _____ Location_____

Furnish the following information:

(a) Provide a description of proposed changes or relief sought, locations with respect to place and distance between designated points is correctly stated in Public Notice____, or should be changed to read as follows:____:

(b) Name of any other railroads affected by proposed changes not shown in Public Notice and manner in which each is affected:

(c) 1. Description of motive power or equipment involved.

2. Describe condition of motive power or equipment relative to compliance with 49 CFR, Parts 215, 229, 231, and 232.

3. Description of the operations for which the waiver of compliance is sought.

4. Information relative to the proposed relief not fully described in the Public Notice.

5. Present method of operation, number of trains or other movements per day, and speed authorizations and restrictions.

6. Summary of accident/incident reports reviewed relative to the proposed relief.

7. Other pertinent facts or remarks.
(Use additional sheets numbering 1a, 1b, 1c, etc)

Page 2 Petition Number_____

(d) List of any prints, bulletins, orders, timetables, etc., obtained during investigation:

(e) List the specific sections from which relief is sought (e.g. 49 CFR 229., 223. etc).

1. Reasons proposed relief is necessary.

2. If any of the proposed changes have been placed in service, give description of such changes, date such changes were placed in service and the reasons for making the changes before the approval of the petition.

(f) Inspector's analysis: The proposed relief will (check one)

___ Reduce protection and safety

___ Provide adequate protection for existing and operating conditions without materially reducing safety

___ Maintain existing protection and safety

___ Increase protection and safety

State reasons:

(g) Inspector's recommendation as to disposition of this application. State reasons:

_____

(Inspectors Signature)

Report of Interview

Reports of interview should be conducted with the following format:

Step 1.

Person Interviewed: Name, Title.

Date and time of Interview: Today's Date and Time.

Method of Interview: State where and how the interview was conducted.

(Example; FRA Office, Blue Springs, Mo.
Via telephone).

Interviewed by: Name and Title of person(s) conducting interview.

Step 2.

This is a report of interview and should be written as such. The conditions, circumstances and/or events described in the body of the report of interview should not be used as a witness statement.

Reports of Interview are generally used in a third person narrative. The example is as follows: In third person narrative the text would read as follows: "Mr. Smith stated that he was standing beside the railroad track when he saw the train depart without a proper train air brake test".

Witness Statement

A. When testimony of a witness is vital to the investigation and the investigator has determined that it is necessary to corroborate the facts, a written statement signed and properly witnessed should be obtained whenever possible.

B. The following outline should be used for the purpose of procuring witness statements.

1. The statement should be captioned: Statement of(Witness Name)

2. The statement should contain the date, time, and place where the statement is taken. The statement must also show the full name of the witness, address and occupational duties.

3. The statement should state that the statement was voluntarily made without coercion, threats or promises by the investigator. (whose name should be recorded in the body of the text). Additionally, the names of all persons in attendance shall be recorded on the statement.

4. The statement taken may be in the form of questions by the investigator and answers by the witness or it may be in the form of a written narrative by the witness. The question and answer method is recommended when the witness lacks the ability to express himself.

5. Remember that it is a statement of the witness and not of the investigator. The text should emulate the style of the witness' vocabulary and use his terms and expression.

6. The statement should include only the facts that are pertinent to the particular incident.

7. It must be confined to things which the witness has actual knowledge and not hearsay.

8. If the witness mentions other persons in the statement, such persons should be identified by name, address, business occupation, etc. when possible.

9. The closing paragraph should state the witness has read the statement and that it is true and correct to the best of their knowledge and belief.

10. If the statement is changed in any manner after it has been written in longhand by the witness, the changes must then be initialed and dated by the witness, directly over the changes. If the statement is given verbally by the witness to the investigator and then typed, or if the statement is written in longhand by the witness and then typed, the witness should read the statement carefully before signing the statement.

11. The statement should be signed by the witness in the presence of the investigator and witnessed by another person if present. The investigator may witness the signature.

12. Important--If the witness declines to sign, the unsigned statement should be transmitted with the final report with an explanation as to the reason for refusal.

If the witness refuses to sign the statement, the investigator should try to determine the reason for refusal. The witness just may have changed his mind in giving a statement. If the witness orally states that the statement is true and correct. The unsigned statement then has evidentiary value in the case.

(C) Recommended form of statement is as follows:

Step 1.

FEDERAL RAILROAD ADMINISTRATION
STATEMENT OF WITNESS TO SAFETY VIOLATION

I, (The witness), make the following voluntary statement to, (The Investigator), who has been identified to me as an Inspector of the Federal Railroad Administration. No threats or promises have been made to induce me to give this statement. I understand that a copy of this statement will be provided to counsel for the railroad and/or shipper involved when and if a civil penalty is demanded for a violation of the railroad safety laws based in whole or in part on this statement. If it subsequently becomes necessary for the Federal Railroad Administration to initiate an administrative hearing or to bring suit to collect such a penalty, I will testify to the facts set forth below in that hearing or lawsuit.

I understand that section 212 of Federal Railroad Safety Act makes it illegal for a common carrier by railroad to discharge or in any manner discriminate against any employee because that employee (1) filed any complaint, and/or instituted or caused to be instituted any proceeding under or related to enforcement of federal railroad safety laws, or (2) testified or is about to testify in any such proceeding. I also understand that any dispute, grievance, or claim that may arise under section 212 will be resolved under the procedures of the Railway Labor Act.

Step 2.

Insert Narrative as prescribed in Sections B. 4. through B. 10.

Step 3.

I have read the above statement and certify that it is all true and correct to the best of my knowledge.

Witness Signature: _____ Date:_____

Signed in the presence of investigator(inspector): _____
Federal Railroad Administration. Date:_____

Witnessed by:_____ Title:_____

Date:_____

US Department of Transportation
Federal Railroad Administration

Notice to Individual Regarding Violation(s) of Federal Railroad Safety Acts or Regulations

The Federal railroad safety laws authorize the Federal Railroad Administration (FRA) to bring enforcement actions directly against individuals who violate those laws. Individuals who willfully violate those laws are subject to civil penalties of up to $20,000 per violation. Individuals whose violation(s) of those laws are shown to make them unfit for the performance of safety-sensitive functions are subject to suspension or disqualification from such service. (Individuals who knowingly violate the hazardous materials regulations are subject to civil penalties of up to $10,000; willful violations of those regulations subject an individual to possible criminal sanctions.) If you have questions about the laws pertaining to railroad safety, contact the officer of your railroad responsible for safety matters or the closest FRA office.

FRA has reason to believe that you violated the law or rule described below. Box 4 below indicates whether or not a violation report recommending enforcement action will be sent to FRA's Office of Chief Counsel. If the box is checked "YES," you will be hearing from that office as to what action will be taken and will have an opportunity to respond at that time. If the box is checked "NO," you should consider this a warning that any future violations you may commit will result in enforcement action. In the case of a warning, you may submit any information in explanation or mitigation to the Regional Director at the address below. A copy of this notice will be provided to your employer, and in the case of joint operations, to the railroad responsible for the operation.

PRIVACY ACT NOTICE: Under authority of the Federal Railroad Safety Act of 1970, as amended, FRA collects the information on this notice for inclusion in its records concerning violations of the railroad safety laws by individuals. Those records may be used to support enforcement actions against individuals and may be disclosed to other government agencies, the public, the railroad industry, or Congress in the interest of promoting compliance with the safety laws. Disclosure of your social security number is voluntary and would be used to distinguish your compliance records from those of someone with the same name and date of birth.

1. SUBJECT:	2. VIOLATION OF 49 CFR: Part	Rule	Subrules	3. F6180 REPORT TYPE & NO.	4. VIOLATION RECOMMENDED ☐ YES ☐ NO

5. NAME *Last:* *First:* *Middle Int.:*

6. ADDRESS *Street:*

City: *State:* *Zip Code:*

7. SOCIAL SECURITY NUMBER:		10. TIME AND DATE OF VIOLATION Time: Date:	
8. DATE OF BIRTH (mm/dd/yy)	9. JOB TITLE OF INDIVIDUAL:	11. INDIVIDUAL NOTIFIED Time: Date:	
12. LOCATION OF VIOLATION City or County: State:	GSA CODE / 13. OPERATING RR CODE / 14. OPR DIVISION CODE	15. EMPLOYING RR CODE	16. EMPLOYING DIVISION CODE

17. SUMMARY OF VIOLATION:

18. NAME OF INSPECTOR(S) I.D. Number	NAME/ADDRESS—Regional Director of Railroad Safety
Date Report Prepared / Date Report Mailed	Registered Mail Number
Signature of Inspector(s) Date	Signature of Regional Director Date

Form FRA F6180.80 (11-89)

White - Individual Green - Employer's Yellow - Office of Safety Pink - Region Goldenrod - Chief Counsel

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

MOTIVE POWER AND EQUIPMENT INSPECTION REPORT

CONTINUATION SHEET

PAGE _____ OF _____

OMB Approval No. 2130-0027

1. INSPECTOR	REPORT I.D. NUMBER	2. REPORT NUMBER	3. REGION	5. RAILROAD	CODE	6. REPORT DATE YEAR	MO.	DAY

10. UNITS INSPECTED					11. EQUIPMENT DEFECTS								RAILROAD FOLLOW-UP			
A. ITEM	B. INITIALS	C. NUMBER	D. KIND	E. 49 CFR PART	A. RULE	B. SUB RULE	C. A B F R	D.	E.	F. FRA ACTION LOCATION	G. TRAIN NUMBER	H. DESCRIPTION	I. ACTION	DATE YEAR	MO.	DAY

Form FRA F 6180-58A (3-81)

US Department of Transportation
Federal Railroad Administration

LOCOMOTIVE INSPECTION AND REPAIR RECORD

In accordance with the Locomotive Inspection Act 36 State, 913, as amended and the regulations issued pursuant to that Act, the parts and appurtenances of the locomotive unit have been inspected and all defects disclosed by the inspection have been properly repaired

Reporting year 19 Check if new loco. ☐ If loco. renumbered give previous no.

1. OPERATED BY RR CODE	2. OWNED BY (Railroad) RR CODE				
3. MODEL NO.	4. LOCO. NO.	5. YR. BUILT	6. PROPELLED BY	7. HORSEPOWER	8. TYPE OF SERVICE: PASSENGER ☐ ROAD ☐ YARD ☐ OTHER ☐
9. STEAM GEN.	GEN. #1. Working Pressure			GEN. #2. Working Pressure	
10. MAXIMUM PISTON TRAVEL inches	TYPE OF AIR BRAKE			11. OUT OF USE CREDIT	
12. LAST PERIODIC INSPECTION DATE				PLACE	

PERIODIC INSPECTIONS

13. DATE MO DAY YR	14. PLACE	15.* ITEMS	16. PERSON CONDUCTING	15.* ITEMS	16. PERSON CONDUCTING	17. CERTIFIED BY

15.* ITEM CODE: [1] BRAKES [2] RUNNING GEAR [3] CAB EQUIP. [4] MECH. EQUIP. [5] ELECT. EQUIP. [6] STEAM GEN. [7] SAFETY APPL.

TESTS	18. H & H TEST PRESSURE	19. WAIVER PART—229	20. WAIVER—OTHER

TYPE	INTERVAL NOT MORE THAN	21. PERSON CONDUCTING	22. TEST DATE AND PLACE	23. CERTIFIED BY	24. PREVIOUS TEST DATE AND PLACE
METER	368 calendar days				
HAMMER AND HYDRO	736 calendar days				
AIRBRAKE 229.27	368 calendar days				
AIRBRAKE 229.29	NUMBER OF CALENDAR DAYS _____				

Certification of true copy.
I certify that this is a true copy of the inspection and repair record of locomotive no. _____

_____ _____
(Officer-in-charge) DATE

ATTENTION: *A false entry on this form is punishable by fine or imprisonment (U.S. Code, Title 18, Sec. 1001).*

FORM FRA F6180-49 A (3-85) OMB Approval No. 2130-0004

GOVERNMENT PROPERTY DO NOT REMOVE

US Department of Transportation
Federal Railroad Administration

SPECIAL NOTICE FOR REPAIRS

PART 1

1. RAILROAD

2. RAILROAD OFFICIAL'S NAME

3. RAILROAD OFFICIAL'S TITLE

4.0 LOCATION

5. DATE

6. TIME

7. IN ACCORDANCE WITH PART 216, TITLE 49, CODE OF FEDERAL REGULATIONS, YOU ARE NOTIFIED THAT: (CHECK ONE)

LOCOMOTIVE UNIT NO. THIS UNIT IS NOT IN SERVICEABLE CONDITION AND SHALL BE REMOVED FROM SERVICE UNTIL IT COMPLIES WITH ALL APPLICABLE REQUIREMENTS OF THE LOCOMOTIVE INSPECTION REGULATION, AND UNTIL ANY ADDITIONAL DEFICIENCIES SET FORTH BELOW HAVE BEEN CORRECTED.

CAR NO. THIS CAR IS NOT IN SERVICEABLE CONDITION AND SHALL BE REMOVED FROM SERVICE UNTIL IT COMPLIES WITH ALL APPLICABLE REQUIREMENTS OF THE FREIGHT CAR SAFETY STANDARDS.

CLASS

MPH PASSENGER

MPH FREIGHT

THE TRACK DESCRIBED BELOW DOES NOT COMPLY WITH THE REQUIREMENTS FOR THE CLASS AT WHICH IT IS BEING OPERATED. THE TRACK IS HEREBY LOWERED TO THE CLASS AND MAXIMUM ALLOWABLE OPERATING SPEEDS INDICATED TO THE LEFT. THESE SPEEDS SHALL NOT BE EXCEEDED UNTIL THE TRACK CONFORMS TO APPLICABLE TRACK SAFETY STANDARDS FOR A HIGHER CLASS.

TRACK DESCRIPTION

RAILROAD DIVISION	RAILROAD SUBDIVISION	TRACK NUMBER	LOCATION FROM STATE	CITY	MILE POST
	REFERENCE MEASUREMENT		LOCATION TO STATE	CITY	MILE POST

8. DEFECTS

WHEN PROPER REPAIRS HAVE BEEN COMPLETED, A DETAILED REPORT OF THE REPAIRS MUST IMMEDIATELY BE SENT TO THE CHIEF MECHANICAL OFFICER (LOCOMOTIVE OR CAR) OR TO THE CHIEF ENGINEER (TRACK) OF YOUR COMPANY FOR HIS APPROVAL. THE FORM MUST THEN BE SENT TO THE REGIONAL ADMINISTRATOR WHOSE ADDRESS IS GIVEN TO THE RIGHT →

USE FORM FRA F 6180-8A, SPECIAL REPAIR REPORT, PART 2.

SIGNATURE OF INSPECTOR

U.S. Department of Transportation
Federal Railroad Administration

VIOLATION OF LOCOMOTIVE INSPECTION ACT

1. REPORT NUMBER	2. COMPANION REPORT NUMBER	
3. INSPECTOR(s) NAME		
4. OPERATING RAILROAD	5. DATE(S) OF VIOLATION	6. TIME OF VIOLATION
7. INSPECTION POINT OR LOCATION	8. DIVISION	9. TYPE OF SERVICE ☐ PASS. ☐ FRT. ☐ YD. ☐ OTHER
10. DATE, TIME & LOCATION OF LAST DAILY INSPECTION	11. DATE, LOCATION OF LAST PERIODIC INSPECTION	
12. LOCOMOTIVE INITIALS AND NUMBER	13. LOCOMOTIVE SERVICE STATUS ☐ TAGGED FOR REPAIRS ☐ OUTBOUND TRAIN ☐ YARD ☐ OTHER ☐ LEAD ☐ INBOUND TRAIN ☐ READY FOR SERVICE	
14 NAME AND TITLE OF RAILROAD OFFICIAL CONTACTED	15. WAS FORM F6180.8, PART I ISSUED? ☐ YES *(attach copy)* ☐ NO	
16. VIOLATION OF 49 CFR SECTION NUMBER	WAS FORM F6180.8, PART II RETURNED? ☐ YES *(attach copy)* ☐ NO	
	17. DESCRIPTION OF USE CONSTITUTING VIOLATION	

18. STATE ALL FACTS NECESSARY TO ESTABLISH VIOLATION AND INCLUDE NAME AND LOCATION OF CUSTODIAN OF THE RECORDS

19. ADDITIONAL INFORMATION

20. SIGNATURE OF INSPECTOR(s)	21. DATE OF SIGNATURE	RESERVED FOR OFFICE OF CHIEF COUNSEL CLAIM NOS:

OMB Approval No. 2130-0509

OMB Approval
2130-0509

US Department of Transportation
Federal Railroad Administration

RAILROAD FREIGHT CAR SAFETY STANDARDS

(49 CFR Part 215)

VIOLATION REPORT

1. NAME OF INSPECTOR(S)

2. VIOLATION REPORT NO. Page 1 of _____

3. INTERCHANGE RAILROAD VIOLATION REPORT NO.

4. OPERATING RAILROAD

5. CAR INITIALS AND NO.

6. CAR DESCRIPTION

a. Type: b. ☐ Empty ☐ Loaded c. ☐ 50 ton ☐ 70 ton ☐ 100 ton ☐ 125 ton d. Placard:

7. ITEM NO.	8. COMPONENT DESCRIPTION	9. DEFECT DESCRIPTION	10. 49 CFR SECTION

11. CAR MARKED FOR REPAIR WITH BAD ORDER TAG	12. TRACK NO.	13. TIME
☐ Yes (described below) ☐ No		a. Inspection: b. Violation:

14. ADDITIONAL INFORMATION

INFORMATION PROVIDED ON THE ATTACHED VIOLATION REPORT SUPPLEMENT IS INCORPORATED BY REFERENCE INTO THIS REPORT

15. SIGNATURE OF INSPECTOR(S)	(Reserved for Office of Chief Counsel)
DATE OF SIGNATURE	Penalty Assessment: $ _____ Claim No. _____

Form FRA F 6180.68 (11-80)

OMB Approval
2130-0509

U.S. Department of Transportation
Federal Railroad Administration

RAILROAD FREIGHT CAR SAFETY STANDARDS
(49 CFR Part 215)

VIOLATION REPORT
(Continuation Page)

NAME OF INSPECTOR(S)

VIOLATION REPORT No.

Page _____ of _____

7. ITEM NO.	8. COMPONENT DESCRIPTION AND LOCATION	9. DEFECT DESCRIPTION (continued from previous page)	10. 49 CFR SECTION

14. ADDITIONAL INFORMATION (continued from previous page).

OMB Approval
2130-0509

U.S. Department of Transportation
Federal Railroad Administration

(49 CFR Part 215)

VIOLATION REPORT SUPPLEMENT

1. NAME OF INSPECTOR(S)

☐ FRA

☐ STATE OF _____

2. VIOLATION REPORT NO(S).

3. INSPECTION REPORT NO.

4. OPERATING RAILROAD

5. STATION

6. PLACE OF INSPECTION

7. DIVISION; SUBDIVISION OR DISTRICT

8. DATE OF VIOLATION(S)

9. SERVICE CONSTITUTING VIOLATION

☐ Placed in train or portion of train.
☐ Outbound movement from location described above.
☐ Inbound movement to location described above.
☐ Movement from repair track.
☐ Other (described in item 17 below).

10. DESCRIPTION OF MOVEMENT OR LOCATION OF CAR(S) AT TIME OF VIOLATION

11. TRAIN NO.

12. LOCOMOTIVE INITIALS AND NUMBER

13. NO. OF CARS IN CONSIST: _____

☐ Approximate
☐ By count ☐ From consist.

14. TIME PERIOD OF INSPECTOR OBSERVATION

15. NOTIFICATION OF VIOLATION(S)

16. RAILROAD RESPONSE

17. ADDITIONAL INFORMATION

SIGNATURE OF INSPECTOR(S)

DATE OF SIGNATURE

(Reserved for Office of Chief Counsel)

Claim No(s).

Form FRA F 6180.69 (11-80)