Track and Structures Compliance Manual

Volume III Railroad Workplace Safety

Chapter 4 On-Track Roadway Maintenance Machines and Hi-Rail Vehicles

2026

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U.S. Department of Transportation

Federal Railroad Administration

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2026 Release Note (Volume III, Chapter 4)

This document was prepared by the Federal Railroad Administration (FRA) Office of Railroad Safety, Track and Structures Division.

Text in *italic font* in this document is regulatory language, whereas indented paragraphs provide field guidance for FRA inspectors. Indented paragraphs are not to be construed as regulatory language in any manner.

This chapter has been updated since the January 2023 release. Changes include:

- Removed the defect codes from the appendix.
- Included the addition of 215.505(i).
- Minor spelling, grammatical, and typographical corrections.
- Formatting changes.

Chapter 4 On-Track Roadway Maintenance Machines and Hi-Rail Vehicles

Introduction

This chapter of the Railroad Workplace Safety Compliance Manual provides guidance for Federal Railroad Administration (FRA) and State personnel to ensure railroads and contractors comply with the federal regulations concerning Part 214 of Title 49 of the Code of Federal Regulations (CFR), specifically, Subpart D, On-Track Roadway Maintenance Machines and Hi-Rail Vehicles. Roadway Maintenance Machine Safety (RMMS) will be used throughout this document to refer to all of Subpart D, including those provisions that relate to hi-rail vehicles, as well as Subpart A and any applicable definitions found in 49 CFR 214.7. This manual is not to be construed as a modification, alteration, or revision of the published RMMS Rule.

Any legal proceeding instituted against a railroad must be based on the official regulations found in the Code of Federal Regulations, Title 49, Part 214, Subpart D, published annually by the Government Printing Office. However, inspectors should refer to this manual to understand the intent of any particular section, thereby assuring to the extent practicable, the nationally uniform application of these rules as intended by the Federal Railroad Administration. The Final Rule, published July 28, 2003, became effective September 26, 2003.

§ 214.7 Definitions

Designated official means any person(s) designated by the employer to receive notification of non-complying conditions on on-track roadway maintenance machines and hi-rail vehicles.

Hi-rail vehicle means a roadway maintenance machine that is manufactured to meet Federal Motor Vehicle Safety Standards and is equipped with retractable flanged wheels so that the vehicle may travel over the highway or on railroad tracks.

Hi-rail vehicle, new means a hi-rail vehicle that is ordered after December 26, 2003 or completed after September 27, 2004.

On-track roadway maintenance machine means a self-propelled, rail-mounted, non-highway, maintenance machine whose light weight is in excess of 7,500 pounds, and whose purpose is not for the inspection of railroad track.

On-track roadway maintenance machine, existing means any on-track roadway maintenance machine that does not meet the definition of a "new on-track roadway maintenance machine."

On-track roadway maintenance machine, new means an on-track roadway maintenance machine that is ordered after December 26, 2003, and completed after September 27, 2004.

§ 214.501 Purpose and scope

501(a) The purpose of this subpart is to prevent accidents and casualties caused by the lawful operation of on-track roadway maintenance machines and hi-rail vehicles.

501(b)This subpart prescribes minimum safety standards for on-track roadway maintenance machines and hi-rail vehicles. An employer may prescribe additional or more stringent standards that are consistent with this subpart.

501(c) Any working condition that involves the protection of employees engaged in roadway maintenance duties covered by this subpart but is not within the subject matter addressed by this subpart, including employee exposure to noise, shall be governed by the regulations of the U.S. Department of Labor, Occupational Safety and Health Administration.

Guidance: Purpose and Scope provides an introduction into the regulation, which governs Roadway Maintenance Machines and the basis of authority for enforcement by Federal and State personnel.

This section, which includes (a), (b), & (c), is designed to prevent accidents and casualties involving on-track maintenance machines and hi-rail vehicles and delineates protection for employees against other dangers such as, but not limited to, exposure to noise via the regulations of the U. S. Department of Labor, Occupational Safety and Health Administration.

It is important to note that the RMMS regulation prescribes physical attribute and inspection requirements for certain roadway maintenance machines. However, railroads and contractors must also comply with the Roadway Worker Protection regulation, 49 CFR Part 214, Subpart C, which prescribes operational and training requirements for roadway maintenance machines.

§ 214.503 Good-faith challenges; procedures for notification and resolution

503(a) An employee operating an on-track roadway maintenance machine or hi-rail vehicle shall inform the employer whenever the employee makes a good-faith determination that the machine or vehicle does not comply with FRA regulations or has a condition that inhibits its safe operation.

Guidance: Each employee operating an on-track roadway maintenance machine or hi-rail is responsible for informing the employer whenever the employee makes a good-faith determination that an on-track roadway maintenance machine or hi-rail vehicle does not comply with FRA regulations or it has a condition that inhibits its safe operation.

The employee should consider the general requirements specified in 214.341 of Subpart C, which also addresses the safety of roadway workers who operate or work near roadway maintenance machines. For example, a roadway maintenance machine covered in Subpart C, but not in Subpart D, would be a track motor car. The inspector should consult the RWP regulation (49 CFR 214, Subpart C) concerning roadway maintenance machines as an additional resource for information with respect to operational safety.

For example, a roadway maintenance machine with no secondary brake system available and no other machine available for coupling may be moved to a clearance or repair point. If there is doubt that the machine can be moved safely, a good-faith challenge would be appropriate.

503(b)Any employee charged with operating an on-track roadway maintenance machine or hi-rail vehicle covered by this subpart may refuse to operate the machine or vehicle if the employee makes a good-faith determination that it does not comply with the requirements of this subpart or has a condition that inhibits its safe operation. The employer shall not require the employee to operate the machine or vehicle until the challenge resulting from the good-faith determination is resolved.

503(c)Each employer shall have in place and follow written procedures to assure prompt and equitable resolution of challenges resulting from good-faith determinations made in accordance with this section. The procedures shall include specific steps to be taken by the employer to investigate each good-faith challenge, as well as procedures to follow once the employer finds a challenged machine or vehicle does not comply with this subpart or is otherwise unsafe to operate. The procedures shall also include the title and location of the employer's designated official.

Guidance: This paragraph requires that the good-faith challenge procedure be in writing in order to provide a prompt and equitable solution for any concern. The written procedure shall also include the title and location of the employer's designated official, who is defined by the rule as any person(s) designated by the employer to receive notification of non- complying conditions on on-track roadway maintenance and hi-rail vehicles. It is incumbent upon the employer to explain to all employees how the procedure is to function. FRA field inspectors should ask the employer how the information concerning the good-faith challenge is disseminated to the workforce.

§ 214.505 Required environmental control and protection systems for new on- track roadway maintenance machines with enclosed cabs

505(a) With the exception of machines subject to paragraph (i) of this section, the following new on-track roadway maintenance machines shall be equipped with enclosed cabs with operative heating systems, operative air conditioning systems, and operative positive pressurized ventilation systems:

(1) Ballast regulators;

(2) Tampers;

(3) Mechanical brooms;

(4) Rotary scarifiers;

(5) Undercutters; and

(6) Functional equivalents of any of the machines identified in paragraphs (a)(1) through (a)(5) of this section.

Guidance: This regulation does not cover air contaminants outside an enclosed cab of new on-track roadway maintenance machines under paragraphs (a)(1) through (a)(6). A new machine, as defined by the rule, is one which is ordered after December 26, 2003, and completed after September 27, 2004.

If an inspector observes what may be a cloud of dust at the work site outside the cab of a machine that is required to have environmental controls, the inspector should ask the carrier's representative about the railroad's respiratory program. If the carrier's representative cannot explain or enforce the railroad's respiratory program, then the inspector and/or specialist should contact Headquarters for assistance. Headquarters, in turn, will contact OSHA in an effort to address the concerns of the field inspector.

A functionally equivalent machine is an on-track maintenance machine that has the ability to operate in any combination as either a ballast regulator, tamper, mechanical broom, rotary scarifier, or undercutter that creates air contaminants, such as silica dust.

505(b) New on-track roadway maintenance machines, and existing on-track roadway maintenance machines specifically designated by the employer, of the types identified in paragraphs (a)(1) through (a)(5) of this section, or functionally equivalent thereto, shall be capable of protecting employees in the cabs of the machines from exposure to air contaminants, in accordance with 29 CFR 1910.1000.

Guidance: FRA is referencing OSHA's regulations already in effect. FRA will address failure to comply with working condition requirements. The section includes the detection of all air contaminants, not only silica.

505(c) An employer shall maintain a list of new and designated existing on-track roadway maintenance machines of the types identified in paragraphs (a)(1) through (a)(5) of this section, or functionally equivalent thereto. The list shall be kept current and made available to the Federal Railroad Administration and other Federal and State agencies upon request.

Guidance: Employers must maintain a roster of roadway maintenance machines, under FRA's jurisdiction, for purposes of this regulation. The employer is required to list new roadway maintenance machines as defined by the regulation as well as equipment "designated" by the employer in accordance with 49 CFR 214.505(d). The inspector must have this information so they may determine if a roadway maintenance machine is new or designated existing. Conceivably, the employer could have only one roster. All other equipment would be considered existing in reference to this section of the regulation.

Note that equipment "designated" in accordance with 49 CFR 214.505(d) will be subject to the requirements to protect employees from air contaminants, as set forth in paragraph (b) of this section. Other requirements in 49 CFR 214.505 do not apply to "designated" equipment, only to "new" equipment.

The roster of roadway maintenance machines may be kept manually or electronically, but must be available upon request to FRA and other state or federal agencies that have responsibility for air contaminant standards and respiratory-related regulations for roadway maintenance machines. Roadway maintenance machines not covered by FRA under the provisions of § 214.505 are covered by OSHA regulations that are often enforced by state agencies and OSHA itself.

505(d) An existing roadway maintenance machine of the type identified in paragraphs (a)(1) through (a)(5) of this section, or functionally equivalent thereto, becomes "designated" when the employer adds the machine to the list required in paragraph (c) of this section. The designation is irrevocable, and the designated existing roadway maintenance machine remains subject to paragraph (b) of this section until it is retired or sold.

Guidance: Employers may elect to include, on this roster, existing roadway maintenance machines that are equipped with engineering controls for air quality. These machines once added to the list will be treated the same as new machines and are then required to meet the requirements of section 505. The roster, which may be electronic, must be readily available upon request to FRA and other Federal and State agencies that have responsibility for air

contaminant standards and respiratory-related regulations for roadway maintenance machines.

505(e) If the ventilation system on a new on-track roadway maintenance machine or a designated existing on-track roadway maintenance machine of the type identified in paragraphs (a)(1) through (a)(5) of this section, or functionally equivalent, becomes incapable of protecting an employee in the cab of the machine from exposure to air contaminants in accordance with 29 CFR 1910.1000, personal respiratory protective equipment shall be provided for each such employee until the machine is repaired in accordance with § 214.531.

Guidance: This paragraph will be enforced by FRA and State "qualified individuals" who are capable of determining whether the exposure is in violation of the environmental standards contained in 29 CFR 1910.1000. Air contaminates are particles added to the air, which are produced by a physical process. An example is silica dust created by placing ballast.

505(f) Personal respiratory protective equipment provided under paragraph (e) of this section shall comply with 29 CFR 1910.134.

Guidance: Paragraphs (a) (e) and (f) require FRA and Sate personnel to be able to identify the employer's personal respiratory protective equipment that must be operative and comply with OSHA 29 CFR 1910.134. These standards require employers to use respirators certified by the National Institute for Occupational Safety and Health (NIOSH). FRA and State field personnel must also determine if the employers have in place a respiratory protection program that includes procedures for proper inspection and maintenance of respirators and medical evaluation of personnel designated to use the respirators.

505(g) New on-track roadway maintenance machines with enclosed cabs, other than the types identified in paragraphs (a)(1) through (a)(5) of this section or functionally equivalent thereto, shall be equipped with operative heating and ventilation systems.

505(h) When new on-track roadway maintenance machines require operation from non-enclosed stations outside of the main cab, the non-enclosed stations shall be equipped, where feasible from an engineering standpoint, with a permanent or temporary roof, canopy, or umbrella designed to provide cover from normal rainfall and midday sun.

505(i) Paragraph (a) of this section is not applicable to machines that are incapable of performing work functions other than by remote operation and are equipped with no operating controls (i.e., remotely operated roadway maintenance machines) if the following conditions are met.

(1) If a remotely operated roadway maintenance machine is operated from the cab of a separate machine, that separate machine must comply with paragraph (a) of this section.

(2) If a remotely operated roadway maintenance machine is operated outside of the main cab of the separate machine in a manner that will expose the operator to air contaminants, as outlined in 29 CFR 1910.1000, the employee shall be protected in compliance with 29 CFR 1910.134.

(3) No person is permitted on the remotely operated roadway maintenance machine while the equipment is operating.

(4) Each remotely operated roadway maintenance machine must be clearly identified by stenciling, marking, or other written notice in a conspicuous location on the machine indicating the potential hazards of the machine being operated from a distance or that the machine may move automatically.

Guidance: Paragraph (i) incorporates prior longstanding waivers from the requirements of § 214.505 that allowed for the use of remotely operated RMMs (i.e., "drones"). Paragraph (i) specifies that paragraph (a) (requiring certain RMMs to be equipped with operational heating, air conditioning, and ventilation systems) does not apply to RMMs that are not capable of performing work functions other than by remote operation and are equipped with no operating controls. Instead, proposed new paragraph (i) would require that if a drone RMM is operated from the cab of a separate machine, that cab must be compliant with paragraph (a) of § 214.505, and if a drone RMM is operated outside of the cab of a separate machine in a way that will expose the operator to air contaminants, the operator must be protected in accordance with OSHA's regulations. Further, proposed new paragraph (i) prohibits a person from being on a drone RMM while it is operating and requires drone RMMs to be clearly marked to indicate the potential hazards of the machine being operated from a distance or that the machine may move automatically. FRA is not prescribing a specific marking requirement, instead § 214.505(i) requires any marking to provide notice that roadway workers should stay clear of the equipment because it may move automatically, and that no person may be on the equipment while it is operating.

§ 214.507 Required safety equipment for new on-track roadway maintenance machines

507(a) Each new on-track roadway maintenance machine shall be equipped with:

(1) A seat for each operator, except as provided in paragraph (b) of this section;

Guidance: This section requires each new on-track roadway maintenance machine be equipped with a seat for each operator, unless the machine is designed to be operated by an operator in the standing position.

(2) A safe and secure position with handholds, handrails, or a secure seat for each roadway worker transported on the machine. Each position shall be protected from moving parts of the machine;

Guidance: The intent is to provide handholds, handrails, or secure seating and to protect riders from the moving parts of roadway maintenance machines.

(3) A positive method of securement for turntables, on machines equipped with a turntable, through engagement of pins and hooks that block the descent of turntable devices below the rail head when not in use;

(4) A windshield with safety glass, or other material with similar properties, if the machine is designed with a windshield. Each new on-track roadway maintenance machine designed with a windshield shall also have power windshield wipers or suitable alternatives that provide the machine operator an equivalent level of vision if windshield wipers are incompatible with the windshield material:

Guidance: The Federal Register Vol. 69, No. 38, Thursday, February 26, 2004, amends the Railroad Maintenance Machine Rule, which became effective September 26, 2004.

The amended 214.507 (a)(4) emphasizes that not all new on-track roadway maintenance machines require windshields. Machines such as but not limited to anchor spreaders, rail heater cars, and spike driving machines may not be designed for windshields. When machines are equipped with new windshields, power windshield wipers or an equivalent such as a "chemical treatment water repellent" would be acceptable.

The amended section became effective April 26, 2004.

(5) A machine braking system capable of effectively controlling the movement of the machine under normal operating conditions;

Guidance: The FRA track inspector should review Subpart C, 214.341(b), which requires the employer to provide and maintain instructions for the safe operation of each roadway maintenance machine with each machine large enough to carry the instruction document.

(6) A first-aid kit that is readily accessible and complies with 29 CFR 1926.50(d)(2); and

Guidance: First aid kits required for new on-track roadway maintenance machines must comply with 29 CFR 1926.50 (d)(2). The regulation "recommends", as an example, the description of the contents of a generic first aid kit described in American National Standard Institute (ANSI) standard Z 308.1 – 1978.

(7) An operative and properly charged fire extinguisher of 5 BC rating or higher which is securely mounted and readily accessible to the operator from the operator's work station.

Guidance: Fire extinguishers required by 214.507 (a)(7) must be operative, properly charged, securely mounted near the operator's work station, and shall be rated 5 BC or higher. In vehicles with enclosed cabs, a fire extinguisher that is placed inside the cab would normally be considered compliant. For on-track roadway maintenance machines that do not have enclosed cabs, a fire extinguisher mounted on the outside of the machine would normally be considered compliant. The main purpose of the requirement for a fire extinguisher is to protect the operator and ensure his or her safe exit from the vehicle.

507(b) Each new on-track roadway maintenance machine designed to be operated and transported by the operator in a standing position shall be equipped with handholds and handrails to provide the operator with a safe and secure position.

507(c) Each new on-track roadway maintenance machine that weighs more than 32,500 pounds light weight and is operated in excess of 20 mph shall be equipped with a speed indicator that is accurate within ± 5 mph of the actual speed at speeds of 10 mph and above.

Guidance: Inspectors need to refer to (d) if the light weight for vehicles noted in Section (c) is not displayed and for the definition of light weight.

507(d) Each new on-track roadway maintenance machine shall have its as-built light weight displayed in a conspicuous location on the machine.

Guidance: The light weight of a machine is calculated when a machine is not loaded with passengers or extraneous equipment not part of the machine itself. The light weight will also provide essential information to crane operators in the event the machines are lifted onto or loaded off of a flat bed truck or rail car for movement to another work site.

§ 214.509 Required visual illumination and reflective devices for new on-track roadway maintenance machines

Each new on-track roadway maintenance machine shall be equipped with the following visual illumination and reflective devices:

509(a) An illumination device, such as a headlight, capable of illuminating obstructions on the track ahead in the direction of travel for a distance of 300 feet under normal weather and atmospheric conditions;

> **Guidance:** This section requires illumination devices, such as headlights to provide visibility in normal weather conditions and atmospheric conditions for a minimal distance of 300 feet. This measure is to be considered under generally clement weather and atmospheric conditions. FRA understands that during periods of rain, fog, snow and other occurrences that are common in normal weather patterns, the lighting capability of the illumination devices may temporarily be unable to reach a full 300 feet. These temporary instances when full illumination is not possible will not be considered a violation of this regulation.

509(b) Work lights, if the machine is operated during the period between one-half hour after sunset and one-half hour before sunrise or in dark areas such as tunnels, unless equivalent lighting is otherwise provided;

509(c) An operative 360-degree intermittent warning light or beacon mounted on the roof of the machine. New roadway maintenance machines that are not equipped with fixed roofs and have a light weight less than 17,500 pounds are exempt from this requirement;

> **Guidance:** The light or beacon required by the paragraph must emit light in a 360 degree field, but does not have to rotate to do so.

509(d) A brake light activated by the application of the machine braking system, and designed to be visible for a distance of 300 feet under normal weather and atmospheric conditions; and

> **Guidance:** New on-track maintenance machines must be equipped with brake lights. The new machines that operate in both directions need to have brake lights on both ends of the machines, even if a machine is wired so that the brake lights apply on both ends at the same time.

505(e) Rearward viewing devices, such as rearview mirrors.

> **Guidance:** New RMMs must be equipped with operative rearward viewing devices or a functional equivalent to enable machine operators to see other machines, personnel, and obstructions. Vision must be established in both directions. Video cameras and monitors may be used to comply with this section.

§ 214.511 Required audible warning devices for new on-track roadway maintenance machines

Each new on-track roadway maintenance machine shall be equipped with:

511(a) A horn or other audible warning device that produces a sound loud enough to be heard by roadway workers and other machine operators within the immediate work area. The

triggering mechanism for the device shall be clearly identifiable and within easy reach of the machine operator; and

511(b) An automatic change-of-direction alarm which provides an audible signal that is at least three seconds long and is distinguishable from the surrounding noise. Change of direction alarms may be interrupted by the machine operator when operating the machine in the work mode if the function of the machine would result in a constant, or almost constant, sounding of the device. In any action brought by FRA to enforce the change-of-direction alarm requirement, the employer shall have the burden of proving that use of the change-of-direction alarm in a particular work function would cause a constant, or almost constant, sounding of the device.

> **Guidance:** The regulation does not include a decibel standard in regard to audible warning devices under Section 511 for new on-track roadway maintenance machines. However, a horn or warning system must be loud enough to be heard by roadway workers and other machine operators within the immediate work area.

§ 214.513 Retrofitting of existing on-track roadway maintenance machines; general

513(a) Each existing on-track roadway maintenance machine shall have a safe and secure position with handholds, handrails, or a secure seat or bench position for each roadway worker transported on the machine. Each position shall be protected from moving parts of the machine.

> **Guidance:** Paragraph (a) was effective September 26, 2003. The intent is to provide handholds, handrails, or secure seating and to protect riders from the moving parts of roadway maintenance machines.
>
> Existing machines, as identified in this section, means a roadway maintenance machine in existence or ordered on or before December 26, 2003, and completed on or before September 27, 2004.

513(b) By March 28, 2005, each existing on-track roadway maintenance machine shall be equipped with a permanent or portable horn or other audible warning device that produces a sound loud enough to be heard by roadway workers and other machine operators within the immediate work area. The triggering mechanism for the device shall be clearly identifiable and within easy reach of the machine operator.

513(c) By March 28, 2005, each existing on-track roadway maintenance machine shall be equipped with a permanent illumination device or a portable light that is securely placed and not hand-held. The illumination device or portable light shall be capable of illuminating obstructions on the track ahead for a distance of 300 feet under normal weather and atmospheric conditions when the machine is operated during the period between one-half hour after sunset and one-half hour before sunrise or in dark areas such as tunnels.

> **Guidance:** Paragraphs (b) & (c) have an effective date of March 28, 2005. Illumination devices noted in Paragraph (c) must be visible for a distance of 300 feet under normal atmospheric conditions.

§ 214.515 Overhead covers for existing on-track roadway maintenance machines

515(a) For those existing on-track roadway maintenance machines either currently or previously equipped with overhead covers for the operator's position, defective covers shall be repaired,

and missing covers shall be reinstalled, by March 28, 2005, and thereafter maintained in accordance with the provisions of § 214.531.

515(b) For those existing on-track roadway maintenance machines that are not already equipped with overhead covers for the operator's position, the employer shall evaluate the feasibility of providing an overhead cover on such a machine if requested in writing by the operator assigned to operate the machine or by the operator's designated representative. The employer shall provide the operator a written response to each request within 60 days. When the employer finds the addition of an overhead cover is not feasible, the response shall include an explanation of the reasoning used by the employer to reach that conclusion.

> **Guidance**: In Paragraph (b), the employer must respond to a request to provide an overhead cover for machines that have not had a previous existing overhead cover in writing within 60 days. This section became effective September 26, 2003. This is not a retrofitting item and the employer is not required to supply an overhead cover if the employer can demonstrate that it is not feasible to install a cover. There may be no room on the machine to install an effective cover or canopy to protect the operator's position, or the machine may not provide a safe place on which a cover may be mounted or attached.

515(c) For purposes of this section, overhead covers shall provide the operator's position with cover from normal rainfall and midday sun.

§ 214.517 Retrofitting of existing on-track roadway maintenance machines manufactured on or after January 1, 1991

In addition to meeting the requirements of § 214.513, after March 28, 2005 each existing on-track roadway maintenance machine manufactured on or after January 1, 1991, shall have the following:

517(a) A change-of-direction alarm or rearview mirror or other rearward viewing device, if either device is feasible, given the machine's design, and if either device adds operational safety value, given the machine's function. In any action brought by FRA to enforce this requirement, the employer shall have the burden of proving that neither device is feasible or adds operational safety value, or both, given the machine's design or work function.

> **Guidance:** An employer does not have to retrofit an existing on-track roadway maintenance machine with either a change-of-direction alarm or a rearward viewing device if a machine's design or function is such that a retrofit of this nature would provide no safety value. The employer who reaches the conclusion that there is no safety value in adding a change of direction alarm or rearward-viewing device will be required to demonstrate, if asked by FRA, why their conclusion is correct.

517(b) An operative heater, when the machine is operated at an ambient temperature less than 50 degrees Fahrenheit and is equipped with, or has been equipped with, a heater installed by the manufacturer or the railroad.

> **Guidance:** This section specifies requirements for existing on-track roadway maintenance machines manufactured on or after January 1, 1991. Consequently, on-track roadway maintenance machines manufactured prior to 1991 are exempt from the requirements contained in this section.

It should be emphasized that heaters previously installed by employees do not have to be re-installed; only heaters installed by either the manufacturer or the railroad apply to this paragraph.

517(c) The light weight of the machine stenciled or otherwise clearly displayed on the machine, if the light weight is known.

Guidance: This paragraph requires the light weight of the machine to be stenciled or otherwise noted if known; if the information is unknown, that would not be a defect.

It should be remembered that on-track roadway maintenance machines manufactured prior to 1991 are exempt from this section and all retrofitting requirements of this section.

The light weight of a machine is calculated when the machine is not loaded with passengers, fuel, or extraneous equipment not part of the machine itself.

517(d) Reflective material, or a reflective device, or operable brake lights.

517(e) Safety glass when its glass is normally replaced, except that replacement glass that is specifically intended for on-track roadway maintenance machines and is in the employer's inventory as of September 26, 2003, may be utilized until exhausted.

Guidance: Inspectors should be aware that not all roadway maintenance machines have the structural strength to accommodate safety glass as it is defined under 49 CFR Part 223. Thus, equivalent safety glass may be used.

517(f) A turntable restraint device, on machines equipped with a turntable, to prevent undesired lowering or a warning light indicating that the turntable is not in the normal travel position.

Guidance: It must be emphasized that this paragraph only applies to a machine equipped with a turntable. If a machine is not equipped with a turntable, an employer cannot be cited for non-compliance with this paragraph.

§ 214.518 Safe and secure positions for riders

On or after March 1, 2004, a roadway worker, other than the machine operator(s), is prohibited from riding on any on-track roadway maintenance machine unless a safe and secure position for each roadway worker on the machine is clearly identified by stenciling, marking, or other written notice.

Guidance: Any employer who allows its roadway workers to ride on a roadway maintenance machine that has neither stenciling, marking, or other written notice identifying safe and secure riding positions will be deemed in violation of the regulation.

Decals should be considered as marking. If riders are not present on roadway maintenance machines, a defect cannot be written for allowing roadway workers to ride on an RMM that does not properly identify a safe and secure position, for non-operators of the equipment. (Inspectors should inquire if roadway workers have been allowed to ride on a machine they suspect of transporting roadway workers; if there is no stenciling, marking, or other written notice, it could be that the employer does not permit non-operators to ride that particular machine. If confirmed that riding has occurred, advise the operator and railroad official that until the machine is properly stenciled, marked, or has written documentation, it may not be used to transport roadway workers.)

§ 214.519 Floors, decks, stairs, and ladders for on-track roadway maintenance machines

Floors, decks, stairs, and ladders of on-track roadway maintenance machines shall be of appropriate design and maintained to provide secure access and footing, and shall be free of oil, grease, or any obstruction which creates a slipping, falling, or fire hazard.

Guidance: This section does not describe what a floor or deck must have to be of appropriate design. Diamond plate, rubber tile, or other slip-resistant material designs are desirable but not required.

The Preamble to the Final Rule states that accumulations of oil, grease, or other obstructions that could create a slipping, falling, or fire hazard must be "properly removed", but does not define the term or provide an example of prompt removal.

Inspectors must exercise discretion when submitting this section for violation action. Photographs depicting this condition are essential. Inspectors should determine if the RMM operator advised the employer's designated official and the roadway worker in charge (RWIC) during the last job briefing of any type of hazard covered in this section. This may indicate a new defect such as a leaking hose or a lack of concern for an ongoing problem. The amount of accumulation may be a definitive factor in determining the length of time the defect has been in existence.

§ 214.521 Flagging equipment for on-track roadway maintenance machines and hi-rail vehicles

Each on-track roadway maintenance machine and hi-rail vehicle shall have on board a flagging kit that complies with the operating rules of the railroad if:

521(a) The equipment is operated over trackage subject to a railroad operating rule requiring flagging; and

(b)

(1) The equipment is not part of a roadway work group; or

(2) The equipment is the lead or trailing piece of equipment in a roadway work group operating under the same occupancy authority.

Guidance: This section states that flagging kits required under the regulation are for operating rule purposes only and do not relate to any requirements under the Roadway Worker Protection regulations in Subpart C. If the railroad does not have an operating rule requiring flagging kits, this section is not applicable and cannot be written as a defect or violation.

Inspectors should review carefully the operating rules of the railroad to determine whether or not flagging kits are required in the carrier's operating rules. Also, FRA inspectors should remember that contractors are governed by the operating rules of the railroad they are working on.

If flagging kits are required by the railroad's operating rules, then the kits must be on each roadway maintenance machine and hi-rail that is operated alone (not part of a group) and on the trailing and lead equipment in a roadway work group.

§ 214.523 Hi-rail vehicles

523(a) The hi-rail gear of all hi-rail vehicles shall be inspected for safety at least annually and with no more than 14 months between inspections. Tram, wheel wear, and gage shall be measured and, if necessary, adjusted to allow the vehicle to be safely operated.

Guidance: Paragraph (a) requires the tram (alignment), wheel wear, and gage to be checked and adjusted on an annual basis. All existing hi-rail vehicle inspections are due within one year from the (September 26, 2003) effective date of the Final Rule.

Thereafter, inspection of existing hi-rail vehicles are due each year on the anniversary date of its first inspection. However, employers are allowed a "two month" window beyond the due date in which to perform the inspection once it becomes due.

As "new" hi-rail vehicles enter service, the inspection is due within one year of the date the vehicle entered service. Again, employers are allowed a "two month" window beyond the due date to comply.

There is no specific requirement as to who may conduct an inspection of the hi-rail vehicle safety-critical components, such as tram (alignment), wheel wear, and gage measurements per the RMMS rule. The employer will determine who is qualified to perform proper annual inspections. The employer shall use the manufacturer's specifications that will ensure the hi-rail can be operated in a safe manner. If there are no criteria provided to measure the tram (alignment), wheel wear, and gage of a hi-rail vehicle, then the inspection would not be in compliance with this section.

523(b) Each employer shall keep records pertaining to compliance with paragraph (a) of this section. Records may be kept on forms provided by the employer or by electronic means. The employer shall retain the record of each inspection until the next required inspection is performed. The records shall be made available for inspection and copying during normal business hours by representatives of FRA and States participating under Part 212 of this chapter. The records may be kept on the hi-rail vehicle or at a location designated by the employer.

523(c) A new hi-rail vehicle shall be equipped with:

(1) An automatic change-of-direction alarm or backup alarm that provides an audible signal at least three seconds long and distinguishable from the surrounding noise; and

(2) An operable 360-degree intermittent warning light or beacon mounted on the outside of the vehicle.

523(d)

(1) The operator of a hi-rail vehicle shall check the vehicle for compliance with this subpart, prior to using the vehicle at the start of the operator's work shift.

Guidance: In Paragraph (d)(1), the regulation requires the operator of a hi-rail vehicle to "check" the vehicle for compliance with this subpart prior to using the vehicle at the start of the operator's work shift.

The word "check" is used. It should be considered to mean to inspect or test for satisfactory conditions; however, there is no required checklist or inspection form required.

The employer may maintain a logbook or inspection record of the hi-rail inspections and/or defects if they choose to do so.

If FRA finds a hi-rail vehicle operating with a non-complying condition that has not been properly tagged or reported, FRA will presume that the hi-rail has not received a proper inspection prior to operation of that shift, unless the operator or employer can show that the defect developed after the inspection was performed. If multiple employees use the same equipment during the same work shift, it is expected that only the first employee will inspect the equipment for that shift.

(2) A non-complying condition that cannot be repaired immediately shall be tagged and dated in a manner prescribed by the employer and reported to the designated official.

(3) Non-complying automatic change-of-direction alarms, backup alarms, and 360-degree intermittent warning lights or beacons shall be repaired or replaced as soon as practicable within seven calendar days.

§ 214.525 Towing with on-track roadway maintenance machines or hi-rail vehicles

525(a) When used to tow pushcars or other maintenance-of-way equipment, each on-track roadway maintenance machine or hi-rail vehicle shall be equipped with a towing bar or other coupling device that provides a safe and secure attachment.

525(b) An on-track roadway maintenance machine or hi-rail vehicle shall not be used to tow pushcars or other maintenance-of-way equipment if the towing would cause the machine or hi-rail vehicle to exceed the capabilities of its braking system. In determining the limit of the braking system, the employer must consider the track grade (slope), as well as the number and weight of pushcars or other equipment to be towed.

Guidance: Paragraph (b) addresses the issue of exceeding the capability of the braking system for an on-track roadway maintenance machine or hi-rail vehicle.

If information is not available concerning the braking capacity of the equipment, a "good-faith" challenge, as noted in 214.503 (a), should be initiated by an employee. Inspectors should be prepared to enforce this section if an employer does not follow the railroad's written procedures for resolving the good-faith challenge.

Also, it may be helpful to determine if the instructions for the safe operation of a roadway maintenance machine, noted in Subpart C 214.341 (b), are understood by all concerned.

As used in §214.525(b), "maintenance-of-way equipment" or "equipment" means another RMM or hi-rail vehicle.

§ 214.527 On-track roadway maintenance machines; inspection for compliance and schedule for repairs

527(a) The operator of an on-track roadway maintenance machine shall check the machine components for compliance with this subpart, prior to using the machine at the start of the operator's work shift.

Guidance: If FRA finds an on-track roadway maintenance machine operating with a non-complying condition that has not been properly tagged or reported, FRA will presume that

the on-track roadway maintenance machine has not received a proper inspection prior to operation of that shift, unless the operator or employer can show that the defect could have developed after the inspection was performed. If multiple employees use the same equipment during the same work shift, it is expected that only the first employee will inspect the equipment for that shift.

527(b) Any non-complying condition that cannot be repaired immediately shall be tagged and dated in a manner prescribed by the employer and reported to the designated official.

Guidance: In Paragraph (b) any non-complying condition that cannot be immediately repaired must be tagged and dated in a manner prescribed by the employer and reported to the designated official. This does not inhibit the employee's right to make a good-faith challenge.

The designated official is any person(s) designated by the employer to receive notification of non-complying conditions on on-track roadway maintenance machines and hi-rail vehicles as noted in 214.503 (c) (good faith challenge).

It is permissible for the employer to use one tag to indicate that more than one defect exists on a roadway maintenance machine or hi-rail. The tag must be clearly visible and used only for the purpose of identifying a non-complying condition. The tag may also contain the instructions to look at the logbook for additional details concerning a non-complying condition.

Maintaining a logbook alone does not comply with the regulation. The defective condition must be tagged and reported. A logbook or other form of documentation may be used by the employer in conjunction with tagging.

527(c) The operation of an on-track roadway maintenance machine with a non-complying condition shall be governed by the following requirements:

(1) An on-track roadway maintenance machine with headlights or work lights that are not in compliance may be operated for a period not exceeding seven calendar days and only during the period between one-half hour before sunrise and one-half hour after sunset.

Guidance: When on-track roadway maintenance machines are operated during the period between one-half hour after sunset and one-half hour before sunrise, or in dimly lit areas such as tunnels, they are required to be equipped with operating work lights unless equivalent lighting is otherwise provided, for example, by portable wayside lighting. See 214.509 (b).

(2) A portable horn may be substituted for a non-complying or missing horn for a period not exceeding seven calendar days;

(3) A fire extinguisher readily available for use may temporarily replace a missing, defective or discharged fire extinguisher on a new on-track roadway maintenance machine for a period not exceeding seven calendar days, pending the permanent replacement or repair of the missing, defective or used fire extinguisher;

Guidance: Fire extinguisher, as addressed in this rule, applies only to new equipment. See 214.507 (a)(7) for detailed information regarding the type of fire extinguisher required. Fire extinguishers must be accessible to the operator from the operator's workstation; however, the paragraph does not require the fire extinguisher to be in the cab of the

on-track roadway maintenance machine. Temporary fire extinguishers must be readily accessible, but do not have to be mounted on the equipment.

(4) Non-complying automatic change-of-direction alarms, backup alarms, and 360-degree intermittent warning lights or beacons shall be repaired or replaced as soon as practicable within seven calendar days; and

(5) A structurally defective or missing operator's seat shall be replaced or repaired within 24 hours or by the start of the machine's next tour of duty, whichever is later. The machine may be operated for the remainder of the operator's tour of duty if the defective or missing operator's seat does not prevent its safe operation.

§ 214.529 In-service failure of primary braking system

529(a) In the event of a total in-service failure of its primary braking system, an on-track roadway maintenance machine may be operated for the remainder of its tour of duty with the use of a secondary braking system or by coupling to another machine, if such operations may be done safely.

529(b) If the total in-service failure of an on-track roadway maintenance machine's primary braking system occurs where other equipment is not available for coupling, the machine may, if it is safe to do so, travel to a clearance or repair point where it shall be placed out of service until repaired.

Guidance: Both paragraphs need to be considered in conjunction with 214.503 (a). When deeming it is safe to move an on-track maintenance machine after a total in-service failure of the primary braking system, if there is a question regarding safety, a "good-faith" challenge would be appropriate.

If there is no doubt regarding safety, then it is permissible to move the equipment, which has had a total in-service failure of its primary braking system.

§ 214.531 Schedule of repairs; general

Except as provided in §§ 214.527(c)(5), 214.529, and 214.533, an on-track roadway maintenance machine or hi-rail vehicle that does not meet all the requirements of this subpart shall be brought into compliance as soon as practicable within seven calendar days. If repairs are not made within seven calendar days, the on-track roadway maintenance machine or hi-rail vehicle shall be placed out of on-track service.

Guidance: This section applies to both new and existing hi-rail vehicles.

§ 214.533 Schedule of repairs subject to availability of parts

533(a) The employer shall order a part necessary to repair a non-complying condition on an on-track roadway maintenance machine or a hi-rail vehicle by the end of the next business day following the report of the defect.

533(b) When the employer cannot repair a non-complying condition as required by § 214.531 because of the temporary unavailability of a necessary part, the employer shall repair the on-track roadway maintenance machine or hi-rail vehicle within seven calendar days after

receiving the necessary part. The employer may continue to use the on-track roadway maintenance machine or hi-rail vehicle with a non-complying condition until receiving the necessary part(s) for repair, subject to the requirements of § 214.503. However, if a non-complying condition is not repaired within 30 days following the report of the defect, the employer shall remove the on-track roadway maintenance machine or hi-rail vehicle from on-track service until it is brought into compliance with this subpart.

533(c) If the employer fails to order a part necessary to repair the reported non-complying condition, or if it fails to install an available part within the required seven calendar days, the on-track roadway maintenance machine or hi-rail vehicle shall be removed from on-track service until brought into compliance with this subpart.

533(d) Each employer shall maintain records pertaining to compliance with this section. Records may be kept on forms provided by the employer or by electronic means. The employer shall retain each record for at least one year, and the records shall be made available for inspection and copying during normal business hours by representatives of FRA and States participating under part 212 of this chapter. The records may be kept on the on-track roadway maintenance machine or hi-rail vehicle or at a location designated by the employer.

Guidance:

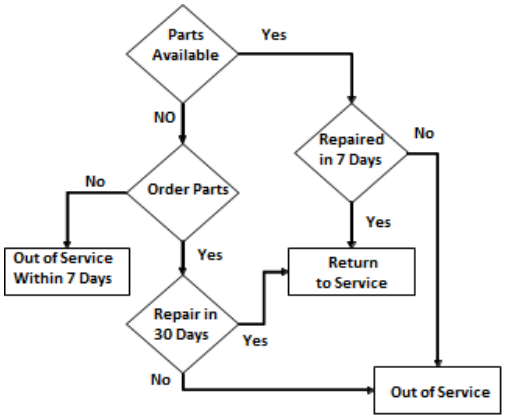

Figure 1: Schedule of Repairs Flow Chart

Appendices

Appendix A – Quick Reference Table

Requirement	On-track RMMS - non-highway and light weight greater than 7,500 lbs. and not used exclusively for inspection of track			Hi-rail - highway vehicles meeting Federal	
	Pre 1/1/91	Existing - post 1/1/91	New - ordered after 12/26/03 and completed after 9/27/04	Existing	New - ordered after 12/26/03 or completed after 9/27/04
Beacon (360-degree warning light)	Not Required*	Not Required*	509 (c) (RMM without fixed roof and less than 17,500 lbs. exempt)	[Motor Vehicle]	523 (c)(2)
Brake light (or reflective material, or reflective device)	Not Required*	517 (d) - retrofit - brake light or reflective material, or reflective device	509 (d) - brake light	[Motor Vehicle]	[Motor Vehicle]
Braking system	Not Required*	Not Required*	507 (a)(5)	[Motor Vehicle]	[Motor Vehicle]
Change-of-direction alarm (or backup alarm for new hi-rails)	Not Required*	517 (a) - retrofit	511 (b)	Not Required*	523 (c)(1)
Daily inspection	527 (a)	527 (a)	527 (a)	523 (d)(1)	523 (d)(1)
Environmental control and protection	505 (d) [designated only - otherwise OSHA]	505 (d) [designated only - otherwise OSHA]	505 (a)-(b) regulators, tampers, etc.	Not Required*	Not Required*
Environmental personal protective respiratory equipment	505 (e) only when environmental control is not working on designated equipment	505 (e) only when environmental control is not working on designated equipment	505 (e) only when environmental control is not working (a)(1)-(5) type equipment	[Motor Vehicle]	[Motor Vehicle]
Fire extinguisher	Not Required*	Not Required*	507 (a)(7)	[Motor Vehicle]	[Motor Vehicle]
First aid kit	Not Required*	Not Required*	507 (a)(6)	[Motor Vehicle]	[Motor Vehicle]

Requirement	On-track RMMS - non-highway and light weight greater than 7,500 lbs. and not used exclusively for inspection of track			Hi-rail - highway vehicles meeting Federal	
	Pre 1/1/91	Existing - post 1/1/91	New - ordered after 12/26/03 and completed after 9/27/04	Existing	New - ordered after 12/26/03 or completed after 9/27/04
Flagging equipment	521 (lone, or lead and trailing piece in roadway group if RR rules require flagging equipment)	521 (lone, or lead and trailing piece in roadway group if RR rules require flagging equipment)	521 (lone, or lead and trailing piece in roadway group if RR rules require flagging equipment)	521 (lone, or lead and trailing piece in roadway group if RR rules require flagging equipment)	521 (lone, or lead and trailing piece in roadway group if RR rules require flagging equipment)
Headlight	513 (c)	513 (c)	509 (a)	[Motor Vehicle]	[Motor Vehicle]
Heating and ventilation	Not Required*	517 (b) - retrofit (required if operated at temp. less than 50 deg. and equipped or has been equipped)	505 (g) for RMM other than 505 (a)(1)-(5), regulators, etc. with enclosed cabs	[Motor Vehicle]	[Motor Vehicle]
Hi-rail gear inspection	Not Applicable	Not Applicable	Not Applicable	523 (a) Annually	523 (a) Annually
Horn	513 (b) permanent or portable	513 (b) permanent or portable	511 (a) permanent	[Motor Vehicle]	[Motor Vehicle]
Light weight display	Not Required*	517 (c) - retrofit	507 (d)	[Motor Vehicle]	[Motor Vehicle]
Operator seat	527 (c)(5)	527 (c)(5)	507 (a)(1) except as required under (b); operator standing	[Motor Vehicle]	[Motor Vehicle]
Overhead cover for operator	515 (a) - missing/repair; (b) feasibility	515 (a) - missing/repair; (b) feasibility	515 applies if no cab (i.e., RMM not requiring environmental cab)	[Motor Vehicle]	[Motor Vehicle]
Overhead for non- enclosed stations outside main cab	Not Required*	Not Required*	505 (h) where feasible	[Motor Vehicle]	[Motor Vehicle]

Requirement	On-track RMMS - non-highway and light weight greater than 7,500 lbs. and not used exclusively for inspection of track			Hi-rail - highway vehicles meeting Federal	
	Pre 1/1/91	Existing - post 1/1/91	New - ordered after 12/26/03 and completed after 9/27/04	Existing	New - ordered after 12/26/03 or completed after 9/27/04
Record of defective conditions	533(d)	533(d)	533(d)	533(d)	533(d)
Record of hi-rail inspection	Not Applicable	Not Applicable	Not Applicable	523(b)	523(b)
Rearward viewing devices	Not Required*	Not Required*	509 (e)	[Motor Vehicle]	[Motor Vehicle]
Safe and secure position with seat for workers transported on machine	513 (a) - retrofit	513 (a) - retrofit	507 (a)(2)	[Motor Vehicle]	[Motor Vehicle]
Safe and secure position for riders - identification by stenciling or other written notice (if used)	518	518	518	[Motor Vehicle]	[Motor Vehicle]
Safety glass & wipers	Not Required*	517 (e) - retrofit/replace	507 (a)(4)	[Motor Vehicle]	[Motor Vehicle]
Secure footing for floors, decks, stairs, and ladders	519	519	519	[Motor Vehicle]	[Motor Vehicle]
Speed indicator	Not Required*	Not Required*	507 (c) - more than 32,500 lbs and speed greater than 20 mph	[Motor Vehicle]	[Motor Vehicle]
Tag defective item(s)	527(b)	527(b)	527(b)	523(d)(2)	523(d)(2)
Towing	525	525	525	525	525
Turntable securement	Not Required*	517 (f) - retrofit; lock or warning light	507 (a)(3) – lock	[Motor Vehicle]	[Motor Vehicle]

Requirement	On-track RMMS - non-highway and light weight greater than 7,500 lbs. and not used exclusively for inspection of track			Hi-rail - highway vehicles meeting Federal	
	Pre 1/1/91	Existing - post 1/1/91	New - ordered after 12/26/03 and completed after 9/27/04	Existing	New - ordered after 12/26/03 or completed after 9/27/04
Work lights	Not Required*	Not Required*	509 (b)	[Motor Vehicle]	[Motor Vehicle]
* NOTE on “not required”: If an existing on-track RMM is equipped with a device only required on new equipment, the device should be in proper working condition. If Inspectors encounter a broken or inoperable Note required” device, they should write a comment to the railroad describing the defective condition and indicating that a machine with “a condition that inhibits its safe operation” is subject to a good faith challenge, especially where roadway workers working on or near the machine may be relying in part on such a device to alert them to a machine’s presence or proximity. FRA expects that any such inoperable device shall be discussed in the job briefing.					