

Chapter 6

Rear End Marking Device— Passenger, Commuter and Freight Trains Part 221

Introduction

This regulation was first published in January, 1977, to reduce the risk of rear end train collisions by requiring at least one highly visible marker be displayed at the trailing end of a passenger, commuter, and freight train during specified times and under certain weather conditions. The requirements of the regulation are generally self explanatory.

The regulation applies to railroads that operate more than one train at any given time on standard gage main track which is part of the general railroad system of transportation. A railroad that operates **only** trains consisting of historical or antiquated equipment for excursion, educational, or recreational purposes and urban rapid transit operations (not connected to the general railroad system of transportation), are also excluded.

In 1986, the regulation was amended in response to railroad operational changes (e.g., elimination of cabooses) and the development of newer technologies. The amended regulation allows:

- Railroads to utilize personnel, other than train crew members, to perform rear marking device inspections (see §221.15©));
- Utilization of radio telemetry to be used in lieu of conducting a visual observation (see §221.15(d));
- And alternate procedures for establishing worker protection while performing a rear marker inspection on main track (see §221.16(b)).

Regulation

§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

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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.

Guidance:

(b)(1) This paragraph excludes railroads that operate only trains consisting of historical or antiquated equipment. A railroad that conducts regular freight and/or passenger train service, but on occasion operates a train consisting of historic or antiquated equipment, would be required to comply with the rule.

(b)(4) This exclusion applies to a railroad that operates only one train at any given time. It does not exclude trains operated on a railroad's branch line.

Regulation

§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.

Guidance:

The term "yard movements" as used in paragraph (a) references movements of on-track rail equipment within the designated limits of a yard. By including such language, the rule excludes most switching operations when performed solely within the confines of a railroad yard. If while performing a "yard movement," the equipment occupies a main track which is outside the designated yard limits, then the equipment becomes a "train" and the requirements of the regulation would apply.

Regulation:

§221.13 Marking device display

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(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 ½ mile on tangent track by a person having 20/20 corrected vision.

(c) Marking devices prescribed by this part and equipped with a functioning 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 the rail.

Guidance:

An operating rear end marking device is required to be displayed at the end of trains operating on, or occupying, a main line track during periods of restricted visibility. If part of a train is within yard limits, but the rear car of the train still occupies the main track, a marking device would be required to be displayed until such time the remaining portion of the train no longer occupied the main track.

Regulation:

§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 crewmember 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.

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Guidance:

Most (but not all) rear marking devices are equipped with a photoelectric cell which will illuminate the marking device during reduced ambient lighting conditions. The device should operate as intended and its operation examined at each crew change point. The examination can be accomplished either visually or (when equipped) by utilizing radio telemetry. If a visual examination is performed by personnel (other than a train crew member assigned to the train), the results of the examination must be communicated to the locomotive engineer.

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 and will remain secure against movement until the inspection has been completed.

Guidance:

The regulation provides procedures for establishing protection for non-train crew members while performing a rear marking device examinations. If the proper operation of the device can be ascertained without positioning the examiner in danger of injury due to unexpected movement of the equipment, then no further action is necessary.

If the equipment is not standing on a “main track” and a “railroad worker” must position themselves in danger of injury due to the unexpected movement of the equipment, the provisions of part 218 (Subpart B-blue signal protection of workers), apply. If the equipment is standing on a “main track” and the task is limited to ascertaining the proper operation of the device, the rule provides an alternate means of establishing worker protection. The railroad worker must personally contact the locomotive engineer positioned in the cab of the controlling locomotive, and must receive assurances from the locomotive engineer that the equipment will remain secure from movement until the inspection is completed. If however, it becomes necessary for the railroad employee to

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perform tasks other than ascertaining the proper operation of the device, then the provisions of part 218 would apply.

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.

Guidance:

The expectation of the rule, is that railroads will maintain a sufficient number of approved rear end marking devices on their system to comply with the regulation. FRA Safety Inspectors should become sufficiently familiar with each railroad operation within their assigned inspection territory, to determine where marking devices are maintained and available. The regulation allows a railroad to continue movement of a train that experiences a marking device failure while en route. The inoperative device must be repaired or replaced at the next forward location where such replacement or repairs can be made. Upon arrival at such location, the railroad is required to replace or repair the device at that point.

Although most end-of-train devices (EOT) incorporate a rear end marking device which is built into the device, the regulatory requirements for the two devices can be mis-interpreted. Each device accomplishes a separate function; the rear end marker increases visibility of trains during low ambient lighting conditions, while the end-of-train device transmits information to the head-end of the train, via radio telemetry. Another distinction is that all trains are required to have an operating rear end marking device (during specified low ambient lighting conditions), but not all trains are required to be equipped with an end-of-train device. It is especially important to become familiar with and understand the differences between the “en route failure” requirements specified in both regulations (see part 232, Subpart E). Deficiencies and/or a recommendation for civil penalty should reference the appropriate regulation, (part 221, for *rear end marking device* or part 232, for *end-of-train device*).

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Approved Rear End Marking Devices

PART I -- APPROVED DEVICES TESTED FOR OR BY MANUFACTURERS

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).

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).

American Electronics, Inc., 1 40 Essex Street, Hackensack, NJ 07601.
NOTE: Yankee Metal Products Corp. previously produced these devices.

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-TL-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.

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: ©) Whelen Engineering Co., Inc., Deep River, Conn. 06417.
FRA identification No. FRA-ATK-WHE-WERT-12.

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Guidance:

Since the regulation was published, FRA has approved additional devices. The following supplements is a listing of the current approved marking devices:

Manufacturer	Model Number
American Electronics, Inc. ¹ 40 Essex Street Hackensack, New Jersey 07601	#300, #301, #305, #306
R. E. Deitz Company 225 Wilkinson Street Syracuse, New York 13201	#70-21/NAPA 510
Donovan Associates P.O. Box 212 Exton, Pennsylvania 19341	#21079
Dynamic Sciences Limited 359 St.Croix Blvd. St. Laurant Quebec H4N 2I3	HVM-401 (also integrated in Digitar Unit)
Federal Sign and Signal Co. 140 East Tower-Burrige Chicago, Illinois	#372
General Electric P.O. Box 1262 Reading, Pennsylvania 10603	—1 (60 PAR/2/R)
Grimes Manufacturing Co. Midland Ross Corp. 515 North Russell Street Urbana, Ohio 43078	85-0583-3, 85-0602-1

¹Yankee Metal Products Corp. previously produced these devices

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Illinois Central Gulf ² Two Illinois Center 233 North Michigan Avenue Chicago, Illinois 60601	High Liner-P 36
Julian A. McDermott Corp. 1639 Stephan Street Long Island, New York 11227	Series 100 (Flasher) ; Series 100 (Steady) Series 300 (Flasher) ; Series 300 (Steady)
Liteco Inc. 205 Main Street Chester, New Jersey 07930	36F and REI 36F-2A
Luminator Division Gulton Industries Inc. 1200 E. Dallas North Parkway	#103086, #0101890-001
Matrix Railway Corporation 69 Nancy Street West Babylon, NY 11704	P21926-2 (LED)
Power Parts Co. 1860 N. Wilmot Avenue Chicago, Illinois 60647	#12155
Pulse Electronics, Inc. Rockville, Maryland	FRA-BN-Pulse 4401 RTP (Portable) FRA-BN-Pulse Train line II
Quantum Engineering, Inc. 322 Stowe Avenue Orange Park, Florida	Q348x (LED)
Pyle National 1334 North Kostner Chicago, Illinois 60651	20585DCJ (200PAR56)

²1437 Marker Light Manufactured by Adams and Westlake Co., Elkhart, Indiana and redesigned by Signal-Stat. Co., 1200 Commerce Avenue, Union, New Jersey 07803

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<p>Safety Products Co. 6144 North Avenue Chicago, Illinois</p>	<p>#6551-77RTVL</p>
<p>Star Headlight and Lantern Co. 168 West Main Street Honoye Falls, New York 14472</p>	<p>845 (Flasher), #845 (Steady) 845S 860-F, #861-F Portables</p>
<p>Translite Incorporated P.O. Box 70 Milford, Connecticut 06460</p>	<p>FM-875-2 (GE-4413R PAR 46) FM-875-2 (GE 60 PAR/2/R) FM-3895-1, (GE 60 PAR/2/R) F-875 (150 PAR 46) F-875 (60 PAR 46) F-875 (4412 PAR 46) C-1785(200 PAR 56) FM-4 491-1 FM-4491-2 FM-4491-3 RC-4193 FM-886 FM-886A FM-5050-1 FM-5050-2 FM-5050-3 RC-2412 FM-5060-1 FM-2304 FM-5051-75 V FM-5051-32V FM-5158 FM-5403 FM-6227 M - 46-1 (LED)</p>
<p>Union Switch & Signal Inc. P.O. Box 539 Batesburg, South Carolina 29006</p>	<p>(Digitar) 6695 Rear Telemetry Unit</p>
<p>Whalen Engineering Co. Inc. Deep River, Connecticut 06417</p>	<p>WERT-12</p>

