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U.S. DEPARTMENT OF TRANSPORTATION

TRACK SAFETY STANDARDS

FEDERAL RAILROAD ADMINISTRATION
OFFICE OF SAFETY

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SUBPART A—GENERAL

§ 213.1 Scope of part.

This part prescribes initial minimum safety requirements for railroad track that is part of the general railroad system of transportation. The requirements prescribed in this part apply to specific track conditions existing in isolation. Therefore, a combination of track conditions, none of which individually amounts to a deviation from the requirements in this part, may require remedial action to provide for safe operations over that track.

§ 213.3 Application.

(a) Except as provided in paragraph (b) of this section, this part applies to all standard gage track in the general railroad system of transportation.

(b) This part does not apply to track—

(1) Located inside an installation which is not part of the general railroad system of transportation; or

(2) Used exclusively for rapid transit, commuter or other short-haul passenger service in a metropolitan or suburban area.

§ 213.4 Excepted track.

A track owner may designate a segment of track as excepted track provided that:

(a) The segment is identified in the time-

- 137.03 Tread portion of frog worn in excess of allowable.
- 139.01 Outer edge of wheel contacting side of spring wing rail.
- 139.02 Toe of wing rail not fully bolted and tight.
- 139.03 Ties under toe or wing rail not solidly tamped.
- 139.04 Bolt hole defect in frog.
- 139.05 Head and web separation in frog.
- 139.06 Insufficient tension in spring to hold wing rail against point rail.
- 139.07 Excessive clearance between hold-down housing and horn.
- 141.01 Raised guard worn excessively.
- 141.02 Frog point rebuilt before restoring guarding face.
- 143.01 Guard check gage less than allowable.
- 143.02 Guard face gage exceeds allowable.
- 205.01 Derail not clearly visible.
- 205.02 Derail operable when locked.
- 205.04 Improper size derail.
- 205.05 Improperly installed derail.

- 135.01 Stock rail not securely seated in switch plates.
- 135.02 Stock rail canted by overtightening rail braces.
- 135.03 Improper fit between switch point and stock rail.
- 135.04 Outer edge of wheel contacting gage side of stock rail.
- 135.05 Excessive lateral or vertical movement of switch point.
- 135.06 Heel of switch insecure.
- 135.07 Insecure switch stand or switch machine.
- 135.08 Insecure connecting rod.
- 135.09 Throw lever operable with switch lock or keeper in place.
- 135.10 Switch position indicator not clearly visible.
- 135.11 Unusually chipped or worn switch point.
- 135.12 Improper switch closure due to metal flow.
- 137.01 Insufficient flangeway depth.
- 137.02 Frog point chipped, broken or worn in excess of allowable.

table, special instructions, general order, or other appropriate records which are available for inspection during regular business hours;

(b) The identified segment is not located within 30 feet of an adjacent track which can be subjected to simultaneous use at speeds in excess of 10 miles per hour;

(c) The identified segment is inspected in accordance with § 213.233(c) at the frequency specified for Class 1 track;

(d) The identified segment of track is not located on a bridge including the track approaching the bridge for 100 feet on either side, or located on a public street or highway, if railroad cars containing commodities required to be placarded by the Hazardous Materials Regulations (49 CFR Part 172), are moved over the track; and

(e) The railroad conducts operations on the identified segment under the following conditions:

(1) No train shall be operated at speeds in excess of 10 miles per hour;

(2) No revenue passenger train shall be operated; and

(3) No freight train shall be operated that contains more than five cars required to be placarded by the Hazardous Materials Regulations (49 CFR Part 172).

§ 213.5 Responsibility of track owners.

(a) Except as provided in paragraph (b) of this section, any owner of track to which this part applies who knows or has notice that the track does not comply with the requirements of this part, shall—

- (1) Bring the track into compliance;
- (2) Halt operations over that track; or

(3) Operate under authority of a person designated under § 213.7(a), who has at least one year of supervisory experience in railroad track maintenance, subject to conditions set forth in this part

(b) If an owner of track to which this part applies designates a segment of track as “excepted track” under the provisions of § 213.4, operations may continue over that track without complying with the provisions of subparts B, C, D, and E.

(c) If an owner of track to which this part applies assigns responsibility for the track to another person (by lease or otherwise), any party to that assignment may petition the Federal Railroad Administrator to recognize the person to whom that responsibility is assigned for purposes of compliance with this part. Each petition must be in writing and include the following:

- (1) The name and address of the track owner;
- (2) The name and address of the person to whom responsibility is assigned (assignee);

- 133.05 Loose, worn or defective switch rod.
- 133.06 Loose, worn or missing switch rod bolts.
- 133.07 Worn or missing cotter pins.
- 133.08 Loose or missing rigid rail braces.
- 133.09 Loose or missing adjustable rail braces.
- 133.10 Missing switch, frog or guard rail plates.
- 133.11 Loose or missing switch point stops.
- 133.12 Loose, worn or missing frog bolts.
- 133.13 Loose, worn or missing guard rail bolts.
- 133.14 Loose, worn or missing guard rail clamps, wedge, separator block or end block.
- 133.15 Obstruction between switch point and stock rail.
- 133.16 Obstruction in flangeway of frog.
- 133.17 Obstruction in flangeway of guard rail.
- 133.18 Insufficient anchorage to restrain rail movement.
- 133.19 Flangeway less than 1½ inches wide.

- 121.04 Worn joint bar allows vertical movement of rail in joint in Class 3 through 6 track.
- 121.05 Less than two bolts per rail at each joint for conventional jointed rail in Class 2 through 6 track.
- 121.06 Less than one bolt per rail at each joint for conventional jointed rail in Class 1 track.
- 121.07 Less than two bolts per rail at any joint in continuous welded rail.
- 121.08 Loose joint bars.
- 121.09 Torch cut or burned bolt hole in joint bar in Class 3 through 6 track.
- 121.10 Torch cut or burned bolt hole in rail in Class 3 through 6 track.
- 123.01 Insufficient tie plates in Class 3 through 6 track.
- 127.01 Insufficient fasteners in a 39 foot track segment.
- 133.01 Loose, worn or missing switch clips.
- 133.02 Loose, worn or missing clip bolts (transit, side jaw, eccentric, vertical).
- 133.03 Loose, worn or defective connecting rod.
- 133.04 Loose, worn or defective connecting rod fastenings.

(3) A statement of the exact relationship between the track owner and the assignee;

(4) A precise identification of the track;

(5) A statement as to the competence and ability of the assignee to carry out the duties of the track owner under this part; and

(6) A statement signed by the assignee acknowledging the assignment to him of responsibility for purposes of compliance with this part.

(d) If the Administrator is satisfied that the assignee is competent and able to carry out the duties and responsibilities of the track owner under this part, he may grant the petition subject to any conditions he deems necessary. If the Administrator grants a petition under this section, he shall so notify the owner and the assignee. After the Administrator grants a petition, he may hold the track owner or the assignee or both responsible for compliance with this part and subject to penalties under § 213.15.

(e) A common carrier by railroad which is directed by the Interstate Commerce Commission to provide service over the track of another railroad under 49 U.S.C. 11125 is considered the owner of that track for the purposes of the application of this part during the period the directed service order remains in effect.

§ 213.7 Designation of qualified persons to supervise certain renewals and inspect track.

(a) Each track owner to which this part applies shall designate qualified persons to supervise restorations and renewals of track under traffic conditions. Each person designated must have—

(1) At least—

(i) 1 year of supervisory experience in railroad track maintenance; or

(ii) A combination of supervisory experience in track maintenance and training from a course in track maintenance or from a college level educational program related to track maintenance;

(2) Demonstrated to the owner that he—

(i) Knows and understands the requirements of this part;

(ii) Can detect deviations from those requirements; and

(iii) Can prescribe appropriate remedial action to correct or safely compensate for those deviations; and

(3) Written authorization from the track owner to prescribe remedial actions to correct or safely compensate for deviations from the requirements in this part.

(b) Each track owner to which this part applies shall designate qualified persons to inspect track for defects. Each person designated must have—

- 113.03 Horizontal split head.
- 113.04 Vertical split head.
- 113.05 Split web.
- 113.06 Piped rail.
- 113.07 Bolt hole crack.
- 113.08 Head web separation.
- 113.09 Broken base.
- 113.10 Detail fracture.
- 113.11 Engine burn fracture.
- 113.12 Ordinary break.
- 113.13 Broken or defective weld.
- 113.14 Damaged rail.
- 115.01 Rail end mismatch on tread of rail exceeds allowable.
- 115.02 Rail end mismatch on gage side of rail exceeds allowable.
- 121.01 Rail joint not of proper design or dimension.
- 121.02 Cracked or broken joint bar in Class 3 through 6 track (other than center break).
- 121.03 Cracked or broken (center break) joint bar.

- 63.03 Deviation from designated elevation of spirals exceeds allowable.
- 63.04 Variation in cross level on spirals in any 31 feet exceeds the allowable.
- 63.05 Deviation from zero cross level at any point on tangent exceeds allowable.
- 63.06 Deviation from designated elevation on curves between spirals exceeds allowable.
- 63.07 Difference in cross level between any two points less than 62 feet apart on tangents exceeds allowable.
- 63.08 Difference in cross level between any two points less than 62 feet apart on curves between spirals exceeds allowable.
- 103.01 Insufficient ballast.
- 103.02 Fouled ballast.
- 109.01 Fewer than minimum allowable number of non-defective ties per 39 feet.
- 109.02 No effective support ties within the prescribed distance from a joint.
- 109.03 Crossties not effectively distributed to support a 39 foot segment of track.
- 113.01 Transverse fissure.
- 113.02 Compound fissure.

- (1) At least—
 - (i) 1 year of experience in railroad track inspection; or
 - (ii) A combination of experience in track inspection and training from a course in track inspection or from a college level educational program related to track inspection;
- (2) Demonstrated to the owner that he—
 - (i) Knows and understands the requirements of this part.
 - (ii) Can detect deviations from those requirements; and
 - (iii) Can prescribe appropriate remedial action to correct or safely compensate for those deviations; and
- (3) Written authorization from the track owner to prescribe remedial actions to correct or safely compensate for deviations from the requirements of this part, pending review by a qualified person designated under paragraph (a) of this section.
 - (c) With respect to designations under paragraphs (a) and (b) of this section, each track owner must maintain written records of—
 - (1) Each designation in effect;
 - (2) The basis for each designation;
 - (3) Track inspections made by each designated qualified person as required by § 213.214.

These records must be kept available for inspection or copying by the Federal Railroad Administrator during regular business hours.

§ 213.9 Class of track: operating speed limits.

(a) Except as provided in paragraphs (b) and (c) of this section and §§ 213.57(b), 213.59 (a), 213.113, and 213.137(b) and (c), the following maximum allowable operating speeds apply:

<i>Over track that meets all of the requirements prescribed in this part for—</i>	<i>The maximum allowable operating speed for freight trains is—</i>	<i>The maximum allowable operating speed for passenger trains is—</i>
Class 1 track	10 m.p.h.	15 m.p.h.
Class 2 track	25 m.p.h.	30 m.p.h.
Class 3 track	40 m.p.h.	60 m.p.h.
Class 4 track	60 m.p.h.	80 m.p.h.
Class 5 track	80 m.p.h.	90 m.p.h.
Class 6 track	110 m.p.h.	110 m.p.h.

(b) If a segment of track does not meet all of the requirements for its intended class, it is reclassified to the next lowest class of track for which it does meet all of the requirements of this part. However, if the segment of track does not at least meet the requirements for Class 1 track, operations may continue at Class 1 speeds for a period of not more than 30 days without bringing the track into compliance, under the authority of a person designated under § 213.7(a), who has at least one

tion by railroad employees of moving equipment.

- 37.08 Excessive vegetation in toepaths and around switches where employees are performing normal trackside duties.
- 37.09 Vegetation brushing sides of rolling stock.
- 53.01 Gage dimension exceeds allowable for tangent track.
- 53.02 Gage dimension is less than allowable for tangent track.
- 53.03 Gage dimension exceeds allowable for curved track.
- 53.04 Gage dimension is less than allowable for curved track.
- 55.01 The alignment of tangent track exceeds the allowable deviation.
- 55.02 The alignment of curved track exceeds the allowable deviation.
- 57.01 Operating speed exceeds allowable, based on curvature and elevation.
- 63.01 Runoff in any 31 feet of rail at end of raise exceeds allowable.
- 63.02 Deviation from uniform profile on either rail exceeds allowable.

- 33.05 Drainage or water carrying facility obstructed by silting.
- 33.06 Drainage facility deteriorated to allow subgrade saturation.
- 33.07 Uncontrolled water undercutting track structure or embankment.
- 37.01 Combustible vegetation around track carrying timber structures.
- 37.02 Vegetation obstructs visibility of railroad signs and fixed signals.
- 37.03 Vegetation obstructs passing of day and night signals by railroad employees.
- 37.04 Vegetation interferes with railroad employees performing normal track-side duties.
- 37.05 Vegetation prevents proper functioning of signal and/or communication lines.
- 37.06 Excessive vegetation at train order office, depot, interlocking plant, carman's building etc., prevents employees on duty from visually inspecting moving equipment when their duties so require.
- 37.07 Excessive vegetation at train meeting points prevents proper inspection

year of supervisory experience in railroad track maintenance, after that person determines that operations may safely continue and subject to any limiting conditions specified by such person.

(c) Maximum operating speed may not exceed 110 m.p.h. without prior approval of the Federal Railroad Administrator. Petitions for approval must be filed in the manner and contain the information required by §§ 211.7 and 211.9 of this chapter. Each petition must provide sufficient information concerning the performance characteristics of the track, signaling, grade crossing protection, trespasser control where appropriate, and equipment involved and also concerning maintenance and inspection practices and procedures to be followed, to establish that the proposed speed can be sustained in safety.

§ 213.11 Restoration or renewal of track under traffic conditions.

If during a period of restoration or renewal, track is under traffic conditions and does not meet all of the requirements prescribed in this part, the work on the track must be under the continuous supervision of a person designated under § 213.7(a) who has at least one year of supervisory experience in railroad track maintenance. The term "continuous supervision" as used in this section means the physical presence of that person at a job site.

However, since the work may be performed over a large area, it is not necessary that each phase of the work be done under the visual supervision of that person.

§ 213.13 Measuring track not under load.

When unloaded track is measured to determine compliance with requirements of this part, the amount of rail movement, if any, that occurs while the track is loaded must be added to the measurements of the unloaded track.

§ 213.15 Civil penalty.

(a) Any owner of track to which this part applies, or any person held by the Federal Railroad Administrator to be responsible under § 213.5(d), who violates any requirement prescribed in this part is subject to a civil penalty of at least \$250 but not more than \$2,500.

(b) For the purpose of this section, each day a violation persists shall be treated as a separate offense.

§ 213.17 Exemptions.

(a) Any owner of track to which this part applies may petition the Federal Railroad Administrator for exemption from any or all requirements prescribed in this part.

(b) Each petition for exemption under this section must be filed in the manner and contain the information required by §§ 211.7 and 211.9 of this chapter.

tions and renewals of track under traffic and/or inspect track for defects.

7.02 Failure of track owner to provide written authorization to qualified designated individuals.

9.01 Failure to restore other than excepted track to compliance with Class 1 Standards within 30 days after a person designated under Section 213.7(a) has determined that operations may safely continue over defect(s) not meeting Class 1 Standard.

9.02 Failure of track owners to enforce over Class 1 defects the limiting conditions imposed by person designated under 213.7(a).

11.01 Proper qualified supervision not provided at work site during work hours when track is being restored or renewed under traffic conditions.

33.01 Drainage or water carrying facility not maintained.

33.02 Drainage or water carrying facility obstructed by debris.

33.03 Drainage facility collapsed.

33.04 Drainage or water carrying facility obstructed by vegetation.

APPENDIX C

Defect Code	Description
4.01	Excepted track segment not identified in appropriate record.
4.02	Excepted track segment located within 30 feet of an adjacent track subject to simultaneous operation at speeds in excess of 10 mph.
4.03	Excepted Track not inspected in accordance with 213.233 (c) as specified for Class 1 track.
4.04	Train speed exceeds 10 mph on excepted track.
4.05	Revenue passenger train operated on excepted track.
4.06	Freight train operated on excepted track with more than five cars required to be placarded in accordance with 49 CFR Part 172.
4.07	Train with a car required to be placarded in accordance with 49 CFR Part 172 operated over excepted track within 100 feet of a bridge or in a public street or highway.
7.01	No written record of names of qualified persons to supervise restora-

(c) If the Administrator finds that an exemption is in the public interest and is consistent with railroad safety, he may grant the exemption subject to any conditions he deems necessary. Notice of each exemption granted is published in the Federal Register together with a statement of the reasons therefore.

SUBPART B—ROADBED

§ 213.31 Scope.

This subpart prescribes minimum requirements for roadbed and areas immediately adjacent to roadbed.

§ 213.33 Drainage.

Each drainage or other water carrying facility under or immediately adjacent to the roadbed must be maintained and kept free of obstruction, to accommodate expected water flow for the area concerned.

§ 213.37 Vegetation.

Vegetation on railroad property which is on or immediately adjacent to roadbed must be controlled so that it does not—

(a) Become a fire hazard to track-carrying structures;

(b) Obstruct visibility or railroad signs and signals;

(c) Interfere with railroad employees performing normal trackside duties;

(d) Prevent proper functioning of signal and communication lines; or

(e) Prevent railroad employees from visually inspecting moving equipment from their normal duty stations.

SUBPART C—TRACK GEOMETRY

§ 213.51 Scope.

This subpart prescribes requirements for the gage, alinement, and surface of track, and the elevation of outer rails and speed limitations for curved track.

§ 213.53 Gage.

(a) Gage is measured between the heads of the rails at right-angles to the rails in a plane five-eighths of an inch below the top of the rail head.

(b) Gage must be within the limits prescribed in the following table:

Class of Track	The gage must be at least—	But not more than
1	4' 8"	4' 10"
2 and 3	4' 8"	4' 9¾"
4 and 5	4' 8"	4' 9½"
6	4' 8"	4' 9¼"

§ 213.55 Alinement.

Alinement may not deviate from uniformity more than the amount prescribed in the following table:

Subpart E—Track Appliance and Track-Related Devices:

		Violation	Hazardous Violation
213.205	Derails	\$500	\$1,000
Subpart F—Inspection			
213.233	Track inspections	\$500	\$1,000
213.235	Switch and track crossings inspections	\$500	\$1,000
213.237	Inspection of rail	\$750	\$1,500
213.239	Special inspections	\$500	\$1,000
213.241	Inspection records	\$750	\$1,500

Note: (1)

For the purposes of this appendix, a hazardous violation is one involving an immediate hazard of death or injury, or when an actual accident, death or injury results from the violation. The Administrator reserves the authority to assess the maximum penalty of \$2,500 for a violation of any section or subsection contained in Part 213.

Subpart B—Roadbed:		Violation	Hazardous Violation
213.33	Drainage	\$500	\$1,000
213.37	Vegetation	\$500	\$1,000
Subpart C—Track Geometry			
213.53	Gage	\$750	\$1,500
213.55	Alinement	\$750	\$1,500
213.57	Curves; elevation and speed limitations	\$750	\$1,500
213.59	Elevation of curved track; runoff	\$750	\$1,500
213.63	Track surface	\$750	\$1,500
Subpart D—Track Structure:			
213.103	Ballast; general	\$500	\$1,000
213.109	Crossties	\$750	\$1,500
213.113	Defective rails	\$1,000	\$2,500
213.115	Rail end mismatch	\$500	\$1,000
213.121	Rail joints		
213.121a		\$500	\$1,000
213.121b		\$500	\$1,000
213.121c		\$1,000	\$2,500
213.121d		\$500	\$1,000
213.121e		\$500	\$1,000
213.121f		\$500	\$1,000
213.121g		\$500	\$1,000
213.123	Tie plates	\$500	\$1,000
213.127	Track spikes	\$750	\$1,500
213.133	Turnouts and track crossings generally	\$500	\$1,000
213.135	Switches	\$500	\$1,000
213.137	Frogs	\$500	\$1,000
213.139	Spring rail frogs	\$750	\$1,500
213.141	Self-guarded frogs	\$500	\$1,000
213.143	Frog guard rails and guard faces; gage	\$500	\$1,000

Class of track	Tangent track	Curved track
	The deviation of the mid-offset from 62-foot line ¹ may not be more than—	The deviation of the mid-ordinate from 62-foot chord ² may not be more than—
1	5"	5"
2	3"	3"
3	1¾"	1¾"
4	1½"	1½"
5	¾"	⅝"
6	½"	⅜"

¹The ends of the line must be at points on the gage side of the line rail, five-eighths of an inch below the top of the railhead. Either rail may be used as the line rail, however, the same rail must be used for the full length of that tangential segment of track.

²The ends of the chord must be at points on the gage side of the outer rail, five-eighths of an inch below the top of the railhead.

§ 213.57 Curves; elevation and speed limitations.

(a) Except as provided in § 213.63, the outside rail of a curve may not be lower than the inside rail or have more than 6 inches of elevation.

(b) The maximum allowable operating speed for each curve is determined by the following formula:

$$v_{\max} = \sqrt{\frac{E_a + 3}{0.0007D}}$$

where

V_{max} = Maximum allowable operating speed (miles per hour).

E_a = Actual elevation of the outside rail (inches).

D = Degree of curvature (degrees).

Appendix A is a table of maximum allowable operating speed computed in accordance with this formula for various elevations and degrees of curvature.

§ 213.59 Elevation of curved track; runoff.

(a) If a curve is elevated, the full elevation must be provided throughout the curve, unless physical conditions do not permit. If elevation runoff occurs in a curve, the actual minimum elevation must be used in computing the maximum allowable operating speed for that curve under § 213.57(b).

(b) Elevation runoff must be at a uniform rate, within the limits of track surface deviation prescribed in § 213.63, and it must extend at least the full length of the spirals. If physical conditions do not permit a spiral long enough to accommodate the minimum length of runoff, part of the runoff may be on tangent track.

§ 213.63 Track surface.

Each owner of the track to which this part applies shall maintain the surface of its track within the limits prescribed in the following table:

**APPENDIX B
SCHEDULE OF CIVIL PENALTIES**

Appendix B reflects a statement of policy by the Federal Railroad Administration in making applicable to Part 213 a specific civil penalty for a violation of particular sections of this part.

Subpart A—General:

		Violation	Hazardous⁽¹⁾ Violation
213.5	Responsibility of track owners	\$1,000	\$2,000
213.7	Designation of qualified persons to supervise certain renewals and inspect track	\$500	\$1,000
213.9	Classes of track: operating speed limits	\$1,000	\$2,000
213.11	Restoration or renewal of track under traffic conditions	\$1,000	\$1,000
213.13	Measuring track not under load	\$500	\$1,000

Appendix A—Maximum Allowable Operating Speeds For Curved Track

Degree of Curvature	Elevation of outer rail (inches)												
	0	½	1	1½	2	2½	3	3½	4	4½	5	5½	6
	Maximum allowable operating speed (mph)												
0°30'	93	100	107										
0°40'	80	87	93	98	103	109							
0°50'	72	78	83	88	93	97	101	106	110				
1°00'	66	71	76	80	85	89	93	96	100	104	107	110	
1°15'	59	63	68	72	76	79	83	86	89	93	96	99	101
1°30'	54	58	62	66	69	72	76	79	82	85	87	90	93
1°45'	50	54	57	61	64	67	70	73	76	78	81	83	86
2°00'	46	50	54	57	60	63	66	68	71	73	76	78	80
2°15'	44	47	50	54	56	59	62	64	67	69	71	74	76
2°30'	41	45	48	51	54	56	59	61	63	66	68	70	72
2°45'	40	43	46	48	51	54	56	58	60	62	65	66	68
3°00'	38	41	44	46	49	51	54	56	58	60	62	64	66
3°15'	36	39	42	45	47	49	51	54	56	57	59	61	63
3°30'	35	38	40	43	45	47	50	52	54	55	57	59	61
3°45'	34	37	39	41	44	46	48	50	52	54	55	57	59
4°00'	33	35	38	40	42	44	46	48	50	52	54	55	57
4°30'	31	33	36	38	40	42	44	45	47	49	50	52	54
5°00'	29	32	34	36	38	40	41	43	45	46	48	49	51
5°30'	28	30	32	34	36	38	40	41	43	44	46	47	48
6°00'	27	29	31	33	35	36	38	39	41	42	44	45	46
6°30'	26	28	30	31	33	35	36	38	39	41	42	43	45
7°00'	25	27	29	30	32	34	35	36	38	39	40	42	43
8°00'	23	25	27	28	30	31	33	34	35	37	38	39	40
9°00'	22	24	25	27	28	30	31	32	33	35	36	37	38
10°00'	21	22	24	25	27	28	29	31	32	33	34	35	36
11°00'	20	21	23	24	26	27	28	29	30	31	32	33	34
12°00'	19	20	22	23	24	26	27	28	29	30	31	32	33

Track surface	Class of track					
	1	2	3	4	5	6
The runoff in any 31 feet of rail at the end of a raise may not be more than	3½"	3"	2"	1½"	1"	½"
The deviation from uniform profile on either rail at the midordinate of a 62-foot chord may not be more than	3"	2¾"	2¼"	2"	1¼"	½"
Deviation from designated elevation on spirals may not be more than	1¾"	1½"	1¼"	1"	¾"	½"
Variation in cross level on spirals in any 31 feet may not be more than	2"	1¾"	1¼"	1"	¾"	½"
Deviation from zero cross level at any point on tangent or from designated elevation on curves between spirals may not be more than	3"	2"	1¾"	1¼"	1"	½"
The difference in cross level between any two points less than 62 feet apart on tangents and curves between spirals may not be more than	3"	2"	1¾"	1¼"	1"	⅝"

SUBPART D—TRACK STRUCTURE

§ 213.101 Scope.

This subpart prescribes minimum requirements for ballast, cross-ties, track assembly fittings, and the physical conditions of rails.

§ 213.103 Ballast; general.

Unless it is otherwise structurally supported, all track must be supported by material which will—

(a) Transmit and distribute the load of the track and railroad rolling equipment to the subgrade;

(b) Restrain the track laterally, longitudinally, and vertically under dynamic loads imposed by railroad rolling equipment and thermal stress exerted by the rails;

(c) Provide adequate drainage for the track; and

(d) Maintain proper track crosslevel, surface, and alignment.

§ 213.109 Cross-ties.

(a) Cross-ties shall be made of a material to which rail can be securely fastened.

(b) Each 39 foot segment of track shall have:

(1) A sufficient number of cross-ties which in combination provide effective support that will:

made of the track involved as soon as possible after the occurrence.

§ 213.241 Inspection records.

(a) Each owner of track to which this part applies shall keep a record of each inspection required to be performed on that track under this subpart.

(b) Each record of an inspection under §§ 213.4, 213.233 and 213.235 shall be prepared on the day the inspection is made and signed by the person making the inspection. Records must specify the track inspected, date of inspection, location and nature of any deviation from the requirements of this part, and the remedial action taken by the person making the inspection. The owner shall retain each record at its division headquarters for at least one year after the inspection covered by the record.

(c) Rail inspection records must specify the date of inspection, the location, and nature of any internal rail defects found, and the remedial action taken and the date thereof. The owner shall retain a rail inspection record for at least two years after the inspection and for one year after remedial action is taken.

(d) Each owner required to keep inspection records under this section shall make those records available for inspection and copying by the Federal Railroad Administrator.

(b) In the case of track that is used less than once a month, each switch and track crossing must be inspected on foot before it is used.

§ 213.237 Inspection of rail.

(a) In addition to the track inspections required by § 213.233, at least once a year a continuous search for internal defects must be made of all jointed and welded rails in Classes 4 through 6 track, and Class 3 track over which passenger trains operate. However, in the case of a new rail, if before installation or within 6 months thereafter, it is inductively or ultrasonically inspected over its entire length and all defects are removed, the next continuous search for internal defects need not be made until three years after that inspection.

(b) Inspection equipment must be capable of detecting defects between joint bars and in the area enclosed by joint bars.

(c) Each defective rail must be marked with a highly visible marking on both sides of the web and base.

§ 213.239 Special inspections.

In the event of fire, flood, severe storm, or other occurrence which might have damaged track structure, a special inspection must be

(i) Hold gage within the limits prescribed in § 213.53(b);

(ii) Maintain surface within the limits prescribed in § 213.63; and

(iii) Maintain alignment within the limits prescribed in § 213.55.

(2) The minimum number and type of cross-ties specified in paragraph (c) of this section effectively distributed to support the entire segment; and

(3) At least one crosstie of the type specified in paragraph (c) of this section that is located at a joint location as specified in paragraph (d) of this section.

(c) Each 39 foot segment of: Class 1 track shall have five crossties; Classes 2 and 3 track shall have eight crossties; Classes 4 and 5 track shall have 12 crossties; and Class 6 track shall have 14 crossties, which are not:

(1) Broken through;

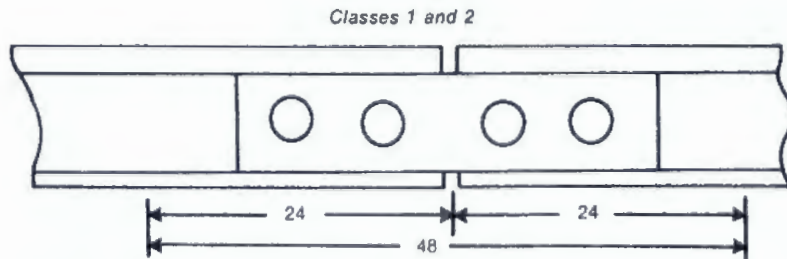
(2) Split or otherwise impaired to the extent the crossties will allow the ballast to work through, or will not hold spikes or rail fasteners;

(3) So deteriorated that the tie plate or base of rail can move laterally more than ½ inch relative to the crossties; or

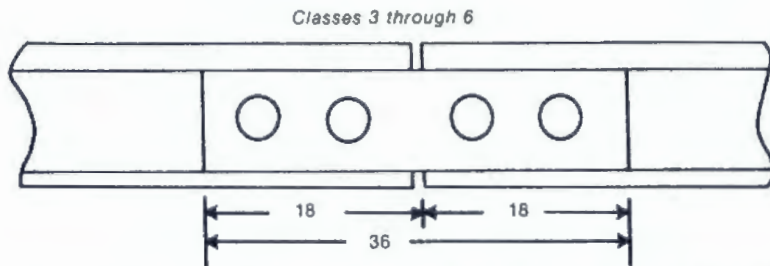
(4) Cut by the tie plate through more than 40 percent of a ties' thickness.

(d) Class 1 and Class 2 track shall have one crosstie whose centerline is within 24 inches

of the rail joint location, and Classes 3 through 6 track shall have one crosstie whose centerline is within 18 inches of the rail joint location. The relative position of these ties is described in the following table.



Each rail joint in Classes 1 and 2 track shall be supported by at least one crosstie specified in paragraph (c) of this section whose centerline is within the 48" shown above.



Each rail joint in Classes 3 through 6 track shall be supported by at least one crosstie specified in paragraph (c) of this section whose centerline is within the 36" shown above.

§ 213.113 Defective rails.

(a) When an owner of track to which this part applies learns, through inspection or otherwise, that a rail in that track contains any of the defects listed in the following table, a person designated under § 213.7 shall de-

(c) Each track inspection must be made in accordance with the following schedule:

Class of track	Type of Track	Required frequency
1, 2, 3	Main track and sidings.	Weekly with at least 3 calendar days interval between inspections, or <i>before use</i> , if the track is used less than once a week, or <i>twice weekly</i> with at least 1 calendar day interval between inspections, if the track carries passenger trains or more than 10 million gross tons of traffic during the preceding calendar year.
1, 2, 3	Other than main track and sidings.	<i>Monthly</i> with at least 20 calendar days interval between inspections.
4, 5, 6		<i>Twice weekly</i> with at least 1 calendar day interval between inspections.

(d) If the person making the inspection finds a deviation from the requirements of this part, he shall immediately initiate remedial action.

§ 213.235 Switch and track crossing inspections.

(a) Except as provided in paragraph (b) of this section, each switch and track crossing must be inspected on foot at least monthly.

§ 213.205 Derails.

(a) Each derail must be clearly visible. When in a locked position a derail must be free of any lost motion which would allow it to be operated without removing the lock.

SUBPART F—INSPECTION

§ 213.231 Scope.

This subpart prescribes requirements for the frequency and manner of inspecting track to detect deviations from the standards prescribed in this part.

§ 213.233 Track inspections.

(a) All track must be inspected in accordance with the schedule prescribed in paragraph (c) of this section by a person designated under § 213.7.

(b) Each inspection must be made on foot or by riding over the track in a vehicle at a speed that allows the person making the inspection to visually inspect the track structure for compliance with this part. However, mechanical, electrical, and other track inspection devices may be used to supplement visual inspection. If a vehicle is used for visual inspection, the speed of the vehicle may not be more than 5 miles per hour when passing over track crossings, highway crossings, or switches.

termine whether or not the track may continue in use. If he determines that the track may continue in use, operation over the defective rail is not permitted until—

- (1) The rail is replaced; or
- (2) The remedial action prescribed in the table is initiated:

Defect	Remedial Action		If defective rail is not replaced, take the remedial action prescribed in note
	Percent of rail head cross-sectional area weakened by defect		
	Less than	But not less than	
Transverse fissure	20		B.
	100	20	B.
		100	A.
Compound fissure	20		B.
	100	20	B.
		100	A.
Detail fracture	20		C.
	100	20	D.
		100	A or E and H.
Engine burn fracture			
Defective weld			

Remedial Action

Defect	Length of defect (inch)		If defective rail is not replaced, take the remedial action prescribed in note
	More than	But not more than	
Horizontal split head	0	2	H and F.
	2	4	I and G.
Vertical split head	4		B.
	(¹)	(¹)	A.
Split web Piped rail Head web separation	0	½	H and F.
	½	3	I and G.
	3		B.
	(¹)	(¹)	A.
Bolt hole crack	0	½	H and F.
	½	1½	G.
	1½		B.
	(¹)	(¹)	A.
Broken base	0	6	E.
	6		A or E and I.
Ordinary break			A or E.
Damaged rail			C.

¹Break out in rail head.

Notes:

A. Assigned person designated under § 213.7 to visually supervise each operation over defective rail.

B. Limit operating speed over defective rail to that as authorized by a person designated under § 213.7(a), who has at least one year of supervisory experience in

§ 213.143 Frog guard rails and guard faces; gage.

The guard check and guard face gages in frogs must be within the limits prescribed in the following table:

Class of track	Guard check gage	Guard face gage
	The distance between the gage line of a frog to the guard line ¹ of its guard rail or guarding face, measured across the track at right angles to the gage line, ² may not be less than—	The distance between guard lines, ¹ measured across the track at right angles to the gage line, ² may not be more than—
1	4' 6½"	4' 5¼"
2	4' 6¼"	4' 5⅞"
3, 4	4' 6¾"	4' 5⅞"
5, 6	4' 6½"	4' 5"

¹A line along that side of the flangeway which is nearer to the center of the track and at the same elevation as the gage line.

²A line ⅝ inch below the top of the center line of the head of the running rail, or corresponding location of the tread portion of the track structure.

SUBPART E—TRACK APPLIANCES and TRACK-RELATED DEVICES

§ 213.201 Scope.

This subpart prescribes minimum requirements for certain track appliances and track-related devices.

worn more than five-eighths inch down and 6 inches back, operating speed over the frog may not be more than 10 miles per hour.

(c) If the tread portion of a frog casting is worn down more than three-eighths inch below the original contour, operating speed over that frog may not be more than 10 miles per hour.

§ 213.139 Spring rail frogs.

(a) The outer edge of a wheel tread may not contact the gage side of a spring wing rail.

(b) The toe of each wing rail must be solidly tamped and fully and tightly bolted.

(c) Each frog with a bolt hole defect or head-web separation must be replaced.

(d) Each spring must have a tension sufficient to hold the wing rail against the point rail.

(e) The clearance between the holddown housing and the horn may not be more than one-fourth of an inch.

§ 213.141 Self-guarded frogs.

(a) The raised guard on a self-guarded frog may not be worn more than three-eighths of an inch.

(b) If repairs are made to a self-guarded frog without removing it from service, the guarding face must be restored before rebuilding the point.

railroad track maintenance.

C. Apply joint bars bolted only through the outermost holes to defect within 20 days after it is determined to continue the track in use in the case of Classes 3 through 6 track, limit operating speed over defective rail to 30 mph until angle bars are applied, thereafter limit speed to 60 mph or the maximum allowable speed under § 213.9 for the class of track concerned, whichever is lower.

D. Apply joint bars bolted only through the outermost holes to defect within 10 days after it is determined to continue the track in use. In the case of Classes 3 through 6 track, limit operating speed over the defective rail to 30 mph or less as authorized by a person designated under § 213.7(a), who has at least one year of supervisory experience in railroad track maintenance, until angle bars are applied, thereafter, limit speed to 60 mph or the maximum allowable speed under § 213.9 for the class of track concerned, whichever is lower.

E. Apply joint bars to defect and bolt in accordance with § 213.121 (d) and (e).

F. Inspect rail 90 days after it is determined to continue the track in use.

G. Inspect rail 30 days after it is determined to continue the track in use.

H. Limit operating speed over defective rail to 60 mph or the maximum allowable speed under § 213.9 for the class of track concerned, whichever is lower.

I. Limit operating speed over defective rail to 30 mph or the maximum allowable speed under § 213.9 for the class of track concerned, whichever is lower.

(b) As used in this section—

(1) "Transverse Fissure" means a progressive crosswise fracture starting from a crystal-line center or nucleus inside the head from which it spreads outward as a smooth, bright, or dark, round or oval surface substantially at

a right angle to the length of the rail. The distinguishing features of a transverse fissure from other types of fractures or defects are the crystalline center or nucleus and the nearly smooth surface of the development which surrounds it.

(2) "Compound Fissure" means a progressive fracture originating in a horizontal split head which turns up or down in the head of the rail as a smooth, bright, or dark surface progressing until substantially at a right angle to the length of the rail. Compound fissures require examination of both faces of the fracture to locate the horizontal split head from which they originate.

(3) "Horizontal Split Head" means a horizontal progressive defect originating inside of the rail head, usually one-quarter inch or more below the running surface and progressing horizontally in all directions, and generally accompanied by a flat spot on the running surface. The defect appears as a crack lengthwise of the rail when it reaches the side of the rail head.

(4) "Vertical Split Head" means a vertical split through or near the middle of the head, and extending into or through it. A crack or rust streak may show under the head close to the web or pieces may be split off the side of the head.

closed positions to allow wheels to pass the switch point. Lateral and vertical movement of a stock rail in the switch plates or of a switch plate on a tie must not adversely affect the fit of the switch point to the stock rail.

(c) Each switch must be maintained so that the outer edge of the wheel tread cannot contact the gage side of the stock rail.

(d) The heel of each switch rail must be secure and the bolts in each heel must be kept tight.

(e) Each switch stand and connecting rod must be securely fastened and operable without excessive lost motion.

(f) Each throw lever must be maintained so that it cannot be operated with the lock or keeper in place.

(g) Each switch position indicator must be clearly visible at all times.

(h) Unusually chipped or worn switch points must be repaired or replaced. Metal flow must be removed to insure proper closure.

§ 213.137 Frogs.

(a) The flangeway depth measured from a plane across the wheel-bearing area of a frog on class 1 track may not be less than $1\frac{3}{8}$ inches, or less than $1\frac{1}{2}$ inches on classes 2 through 6 track.

(b) If a frog point is chipped, broken, or

determination of a qualified Federal or State track inspector, effectively maintain gage within the limits prescribed in § 213.53(b). The term "qualified State track inspector" as used in this section means a track inspector who meets the qualification requirements of 49 CFR 212.203. (Formerly § 212.75).

§ 213.133 Turnouts and track crossings generally.

(a) In turnouts and track crossings, the fastenings must be intact and maintained so as to keep the components securely in place. Also, each switch, frog, and guard rail must be kept free of obstructions that may interfere with the passage of wheels.

(b) Classes 4 through 6 track must be equipped with rail anchors through and on each side of track crossings and turnouts, to restrain rail movement affecting the position of switch points and frogs.

(c) Each flangeway at turnouts and track crossings must be at least 1½ inches wide.

§ 213.135 Switches.

(a) Each stock rail must be securely seated in switch plates, but care must be used to avoid canting the rail by overtightening the rail braces.

(b) Each switch point must fit its stock rail properly, with the switch stand in either of its

(5) "Split Web" means a lengthwise crack along the side of the web and extending into or through it.

(6) "Piped Rail" means a vertical split in a rail, usually in the web, due to failure of the shrinkage cavity in the ingot to unite in rolling.

(7) "Broken Base" means any break in the base of a rail.

(8) "Detail Fracture" means a progressive fracture originating at or near the surface of the rail head. These fractures should not be confused with transverse fissures, compound fissures, or other defects which have internal origins. Detail fractures may arise from shelly spots, head checks, or flaking.

(9) "Engine Burn Fracture" means a progressive fracture originating in spots where driving wheels have slipped on top of the rail head. In developing downward they frequently resemble the compound or even transverse fissures with which they should not be confused or classified.

(10) "Ordinary Break" means a partial or complete break in which there is no sign of a fissure, and in which none of the other defects described in this paragraph are found.

(11) "Damaged Rail" means any rail broken or injured by wrecks, broken, flat, or unbalanced wheels, slipping, or similar causes.

§ 213.115 Rail end mismatch.

Any mismatch of rails at joints may not be more than that prescribed by the following table:

Class of track	Any mismatch of rails at joints may not be more than the following—	
	On the tread of the rail ends (inch)	On the gage side of the rail ends (inch)
1	1/4	1/4
2	1/4	3/16
3	3/16	3/16
4, 5	1/8	1/8
6	1/8	1/8

§ 213.121 Rail joints.

(a) Each rail joint, insulated joint, and compromise joint must be of the proper design and dimensions for the rail on which it is applied.

(b) If a joint bar on classes 3 through 6 track is cracked, broken, or because of wear allows vertical movement of either rail when all bolts are tight, it must be replaced.

(c) If a joint bar is cracked or broken between the middle two bolt holes it must be replaced.

(d) In the case of conventional jointed track, each rail must be bolted with at least

two bolts at each joint in classes 2 through 6 track, and with at least one bolt in class 1 track.

(e) In the case of continuous welded rail track, each rail must be bolted with at least two bolts at each joint.

(f) Each joint bar must be held in position by track bolts tightened to allow the joint bar to firmly support the abutting rail ends and to allow longitudinal movement of the rail in the joint to accommodate expansion and contraction due to temperature variations. When out-of-face, no-slip, joint-to-rail contact exists by design, the requirements of this paragraph do not apply. Those locations are considered to be continuous welded rail track and must meet all the requirements for continuous welded rail track prescribed in this part.

(g) No rail or angle bar having a torch cut or burned bolt hole may be used in classes 3 through 6 track.

§ 213.123 Tie plates.

(a) In classes 3 through 6 track where timber crossties are in use there must be tie plates under the running rails on at least eight of any 10 consecutive ties.

§ 213.127 Rail fastenings.

Each 39 foot segment of rail shall have a sufficient number of fastenings which, in the

