

Track Safety Standards
Track Safety Standards Working Group Consensus with exception
to definition for “Segment”
July 29, 2010

§ 213.113 Defective rails.

(a) When an owner of track learns that a rail in the track contains any of the defects listed in the table in paragraph (c), a person designated under § 213.7 shall determine whether the track may continue in use. If the designated person determines that the track may continue in use, operation over the defective rail is not permitted until –

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

(b) When an owner of track learns, through **an internal** rail inspection, that rail contains an indication of any of the defects listed in the table, in paragraph (c), the track owner shall verify the indication within 4 hours. If the track owner has an indication that any of the defects that require remedial action A, A2 or B in the following table exist, the track owner shall immediately verify the indication and if the indication is verified –

- 1) Replace or repair the rail; or
- 2) Initiate the remedial action prescribed in the table

(c) Remedial Action Table

A track owner who learns that a rail contains one of the following defects shall prescribe the below remedial action if the rail is not replaced or repaired-

REMEDIAL ACTION TABLE

| Defect | Length of defect (inch) | | Percentage of existing rail head cross-sectional area weakened by defect | | If the defective rail is not replaced or repaired, take the remedial action prescribed in note |
|---|--|--|--|--|--|
| | More than | But not more than | Less than | But not less than | |
| Compound Fissure | | | 70 100 | 5 70 100 | B A2 A |
| Transverse Fissure Detail Fracture Engine Burn Fracture Defective Weld | | | 25 60 100 | 5 25 60 100 | C. D. [A2] or [E and H]. [A] or [E and H]. |
| Horizontal Split Head Vertical Split Head Split Web Piped Rail Head Web Separation Defective Weld (Longitudinal) | 1 2 4..... (¹) | 2 4 (¹) | ..... ..... ..... ..... | ..... ..... ..... (¹)..... | H and F. I and G. B A. |
| Bolt Hole Crack | ½ 1 1½..... (¹) | 1 1½ (¹) | ..... ..... ..... ..... | ..... ..... ..... (¹)..... | H and F. H and G. B A. |
| Broken Base | 1 6 (²)..... | 6 ..... | ..... | ..... | D. [A] or [E and I]. |
| Ordinary Break | ..... | ..... | ..... | ..... | A or E. |
| Damaged Rail | ..... | ..... | ..... | ..... | C |
| Flattened Rail Crushed Head | Depth > 3/8 and Length > 8 | ..... | ..... | ..... | H. |

- (1) Break out in rail head [**will be handled in compliance manual**].
- (2) **Remedial action D applies to a moon-shaped breakout, resulting from a derailment, with length greater than 6 inches but not exceeding 12 inches and width not exceeding 1/3 the rail base width.**

(in preamble language – note that a special inspection pursuant to 213.239 should be done to assess track conditions.)

Notes

(A, A2 and B remain unchanged)

C. 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 5 track, limit operating speed over defective rail to 30 m.p.h. until joint bars are applied; thereafter, limit speed to 50 m.p.h. or the maximum allowable speed under Sec. 213.9 for the class of track concerned, whichever is lower.

When a search for internal rail defects is conducted under Sec. 213.237, and defects are discovered in Classes 3 through 5 which require remedial action C, the operating speed shall be limited to 50 m.p.h., or the maximum allowable speed under Sec. 213.9 for the class of track concerned, whichever is lower, for a period not to exceed 4 days. If the defective rail has not been removed from the track or a permanent repair made within 4 days of the discovery, limit operating speed over the defective rail to 30 m.p.h. until joint bars are applied; thereafter, limit speed to 50 m.p.h. or the maximum allowable speed under Sec. 213.9 for the class of track concerned, whichever is lower.

When joint bars have not been applied within 10 days, the speed must be limited to 10 mph until joint bars are applied.

D. Apply joint bars bolted only through the outermost holes to defect within 7 days after it is determined to continue the track in use. In the case of Classes 3 through 5 track, limit operating speed over the defective rail to 30 m.p.h. or less as authorized by a person designated under Sec. 213.7(a), who has at least one year of supervisory experience in railroad track maintenance, until joint bars are applied; thereafter, limit speed to 50 m.p.h. or the maximum allowable speed under Sec. 213.9 for the class of track concerned, whichever is lower.

When joint bars have not been applied within 7 days, the speed must be limited to 10 mph until the joint bars are applied.

(E remains unchanged)

F. Inspect rail within 90 days after it is determined to continue the track in use. If the rail remains in track and is not replaced or repaired, the reinspection cycle starts over with each successive reinspection unless the reinspection reveals the rail defect to have increased in size and has therefore become subject to a more restrictive remedial action. This process continues indefinitely until the rail is removed from track or repaired. If not inspected within 90 days, limit speed to Class 2 or the maximum allowable speed under 213.9 for the class of track concerned, whichever is lower, until inspected.

G. Inspect rail within 30 days after it is determined to continue the track in use. If the rail remains in track and is not replaced or repaired, the reinspection cycle starts over with each successive reinspection unless the reinspection reveals the rail defect to have increased in size and has therefore become subject to a more restrictive remedial action.

This process continues indefinitely until the rail is removed from track or repaired. If not inspected within 30 days, limit speed to Class 2 or the maximum allowable speed under 213.9 for the class of track concerned, whichever is lower, until inspected.

(H and I remain unchanged)

(b) As used in this section—

Compound fissure means a progressive fracture originating from a horizontal split head which turns up or down, or in both directions, in the head of the rail. Transverse development will normally progress substantially at a right angle to the length of the rail.

Crushed Head means a short length of rail, not at a joint, which has drooped or sagged across the width of the rail head to a depth of $\frac{3}{8}$ inch or more below the rest of the rail head. Unlike the flattened (rail) head where the depression is visible on the rail head only, the sagging or drooping is also visible in the head web fillet area.

(Crushed rail head normally results from a soft rail head or from the rail head achieving its fatigue developmental limits. For the compliance manual – measurements will not include localized chips or pitting.)

Damaged rail means any rail broken or **injured** by wrecks, broken, flat, or unbalanced wheels, wheel slipping, or similar causes.

(explain in the preamble that this is not caused by ordinary rail fatigue. Also explain that any rail that is broken should be treated like an **ordinary break**, not a damaged rail. See definition for ordinary brake to be able to distinguish between damaged/cracked and broken)

Defective weld means a field or plant weld containing any discontinuities or pockets, exceeding 5 percent of the rail head area individually or 10 percent in the aggregate, oriented in or near the transverse plane, due to incomplete penetration of the weld metal between the rail ends, lack of fusion between weld and rail end metal, entrapment of slag or sand, underbead or shrinkage cracking, or fatigue cracking. Weld defects may originate in the rail head, web, or base, and in some cases, cracks may progress from the defect into either or both adjoining rail ends. If the weld defect progresses longitudinally through the weld section, the track owner must remediate as if it were a split web.

§213.237 Inspection of rail.

(a) In addition to the inspections required by §213.233, a track owner shall conduct internal rail inspections sufficient to maintain fatigue service failure rates per segment, to be determined for the track owner's 12-month period, as calculated within 45 days of the end of the period. These rates shall not include fatigue service failures that occurred in rail that has been replaced through rail relay since the time of the fatigue service failure.

Rail used to repair a fatigue service failure defect is not considered rail relay. The fatigue service failure rates shall be—

- (1) No more than 0.1 fatigue service failures per year per mile of track for all class 4 and 5 track;
- (2) No more than 0.09 fatigue service failures per year per mile of track for all class 3,4, and 5 track which carries regularly scheduled passenger trains or is a hazardous material route; and
- (3) No more than 0.08 fatigue service failures per year per mile of track for all class 3,4, and 5 track which carries regularly scheduled passenger trains and is a hazardous material route.

(b) Internal rail inspections on class 4 and 5 track, or class 3 track with regularly scheduled passenger trains or is a hazardous materials route, shall not exceed a time interval of 370 days between inspections or a tonnage interval of 30 mgt between inspections whichever is shorter. Internal rail inspections on class 3 track without regularly scheduled passenger trains and which is not a hazardous materials route must be inspected at least once each calendar year, with no more than 18 months between inspections, or at least once every 30 mgt, whichever interval is longer, with the additional provision that inspections cannot be more than 5 years apart.

(c) If the fatigue service failure rate target identified in paragraph (a) is not achieved, the track owner must inform the FRA of this fact within 45 days of the end of the defined 12-month period in which the performance target is exceeded.

- (1) If the performance target rate is not met for two consecutive years, then in the area which is driving the fatigue service failure rate, either:
 - (i) The inspection tonnage interval between tests must be reduced to 10 MGT; or
 - (ii) The class of track shall be reduced to class 2 until the target fatigue service failure rate is achieved.
- (2) In cases where a single fatigue service failure would cause the rate to exceed the applicable fatigue service failure rate, the fatigue service failure rate will be considered as achieved unless a second such failure occurs within a designated 12-month period.
- (3) Periods occurring prior to the promulgation of this rule are not to be included in determination of consecutive periods where the fatigue service failure rate has not been achieved.

(put in preamble language = In addition, the owner can provide to FRA an explanation as to why the performance target was not achieved and provide a remedial action plan)

(d) Each defective rail shall be marked with a highly visible marking on both sides of the web and base except that, where a side or sides of the web and base are inaccessible because of permanent features, the highly visible marking will be placed on or next to the head of the rail.

(e) Inspection equipment shall be capable of detecting defects between joint bars, in the area enclosed by joint bars.

(f) If the qualified rail defect detection equipment operator determines that a valid search for internal defects could not be made over a particular length of track, that particular length of track cannot be considered as internally inspected under paragraphs (a) and (b).

(g) If a valid search for internal defects cannot be conducted, the track owner will, before expiration of time or tonnage limits in (b) or (c)—

- (1) Conduct a valid search for internal defects;
- (2) Reduce operating speed to a maximum of 25 mph until such time as a valid search can be made; or
- (3) Replace the rail that had not been inspected.

(h) The person assigned to operate the rail defect detection equipment must be a qualified operator as defined in §213.238 and have demonstrated proficiency in the rail flaw detection process on each type of equipment the operator is assigned.

(i) As used in this section –

Hazardous materials route means a track over which a minimum of 10,000 car loads or intermodal portable tank car loads of material defined in 49 CFR 171.8 “hazardous material,” or a minimum of 4,000 car loads or intermodal portable tank car loads of material defined in 49 CFR 172.820(a) on class 3, 4 or 5 of track over a period of one year.

****NON-CONSENSUS ITEM – definition of segment****

Segment means a track owner’s designated segment, which is class 4 or 5 track, or class 3 track that carries regularly scheduled passenger trains or is a hazardous material route.

Fatigue service failure means a broken rail occurrence, the cause of which is determined to be a compound fissure, transverse fissure, detail fracture, or vertical split head.

Valid search means a continuous inspection for internal rail defects where the equipment is performing as intended and equipment responses are interpreted by a qualified operator as defined in § 213.238. The operator shall determine that the test has not been compromised due to environmental contamination, rail conditions, or equipment.

§ 213. 238 Qualified operator.

Each provider of rail flaw detection shall have a documented training program in place and shall identify the types of rail flaw detection equipment on which each operator has received training and is qualified.

(a) A qualified operator shall be trained and shall have written authorization by the employer to:

- (1) Conduct a valid search for internal rail defects utilizing specific type (s) of equipment they are authorized and qualified to operate;
- (2) Determine that such equipment is performing as intended;
- (3) Interpret equipment responses and institute appropriate action in accordance with the employer's procedures and instructions;
- (4) Determine that each valid search for an internal rail defect is continuous throughout the area inspected and has not been compromised due to environmental contamination, rail conditions, or equipment malfunction.

(b) The operator must have received training in accordance with the internal documented training process and complete a minimum of 160 hours rail flaw detection experience under direct supervision of a qualified operator or rail flaw detection equipment manufacturer representative. The operator must demonstrate proficiency in the rail defect detection process, including equipment to be utilized, prior to initial qualification and authorization by the employer on each type of equipment.

(c) Re-evaluation and any necessary recurrent training shall be determined in accordance to a documented internal policy. The re-evaluation and recurrent training can consist of a periodic review of test data submitted by the operator as determined by an internal audit process. The re-evaluation process shall require that the employee successfully complete a recorded examination and demonstrate proficiency to the employer on the specific equipment type(s) to be operated

(d) Each employer of an authorized qualified individual shall maintain written or electronic records of each qualification in effect. Each record shall include the name of the employee, the equipment to which the qualification applies, and the date of qualification and date of most recent successful re-evaluation.

(e) Employees' that have demonstrated proficiency in the operation of rail flaw detection equipment prior to 7/1/09 shall be grandfathered into the program and considered a qualified operator, regardless of the previous training program they were qualified under. Such grandfathered operators shall be subject to paragraph (c).

(f) Qualification records as well as a copy of equipment-specific training programs and materials, recorded examinations, demonstrated proficiency records, and authorization records shall be kept at a location designated by the employer and available for inspection and copying by the Federal Railroad Administration during regular business hours.

§ 213.241 Inspection records.

(a) and (b) remain unchanged.

(c) Records of internal rail inspections performed under § 213.237 shall specify:

- 1) the date of inspection;
- 2) the track inspected, including beginning and end points;
- 3) the location and type of defects found under § 213.113;
- 4) size of defects found under § 213.113 if not removed prior to the next train movement;
- 5) the initial remedial action taken and the date thereof; and
- 6) the location of any intervals of track not tested per § 213.237(d).

(d) The owner shall retain a rail inspection record under § 213.241(c) for at least two years after the inspection and for one year after initial remedial action is taken.

(e) The owner must maintain records sufficient to demonstrate the means by which it computes the fatigue service failure rate on all track segments subject to the requirements in § 213.237(a) for the purpose of determining compliance with the applicable fatigue service failure rate target.

(current 213.241(d) and rest will be moved to 213.241(f), etc.)