

# **SASKATCHEWAN TRACK SAFETY STANDARDS**

For use on provincially regulated railways

These standards were approved by the Deputy Minister of Highways and Transportation on August 01, 2003 under the authority of *The Railway Act*.

The information in this publication is to be considered solely as a guide and should not be quoted as or considered to be a legal authority.

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## **PART I – GENERAL**

### **1. SHORT TITLE**

- 1.1 These standards may be cited as the Saskatchewan Track Standards.

### **2. INTERPRETATION**

In these standards;

- 2.1 “certificate” means a document issued by a railway company pursuant to section 11 that indicates the name and occupational category of the certificate holder;
- 2.2 “line of track” or “track” means a railway of any length including yard tracks, sidings, spurs, and other tracks auxiliary thereto, and including the right-of-way and the structures supporting or protecting the track or facilitating drainage from the track;
- 2.3 “main track” means a track extending through yards and between stations, upon which trains or engines are authorized and governed by one or more methods of control;
- 2.4 “railway company” means a railway owner that is subject to the legislative authority of Saskatchewan;

- 2.5 “railway crossing” means the crossing of two tracks;
- 2.6 “track inspector” means an employee of the railway company appointed in this capacity;
- 2.7 “track supervisor” means an employee of the railway company appointed in this capacity;
- 2.8 “Provincial Inspector” means an inspector appointed by the minister pursuant to section 23 of The Railway Act or designate thereof.

### **3. SCOPE**

- 3.1 These standards prescribe minimum safety requirements for railway track that is part of the general railway system of transportation. The requirements prescribed in these standards apply to specific track conditions existing in isolation. Therefore, a combination of track conditions, none of which individually amounts to a deviation from these standards may require remedial action to provide for safe operations over that track.
- 3.2 Nothing in these standards prevents a railway from prescribing a higher level of maintenance.

## **4. APPLICATION**

- 4.1 These standards apply to all provincially regulated railway companies operating on standard gauge track.
- 4.2 The purpose of these standards is to ensure the safe operation of trains on standard gauge track owned by, operated on or used by a railway company.

## **5. EXCEPTED TRACK**

- 5.1 A railway company may designate a segment of track as excepted track provided that:
  - a) The segment is identified in the timetable, special instruction, 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 the frequency specified for Class 1 track;

- d) The railway conducts operations on the identified segment under the following conditions;
- i) No train shall be operated at speeds in excess of 10 miles per hour; and
  - ii) No occupied passenger train or train carrying dangerous goods shall be operated.
  - iii) The railway company shall advise the Provincial Railway Inspector within 10 days of designating a segment of track as “excepted track”.
  - iv) The gauge on excepted track shall not be more than 58 1/4".
  - v) When a railway company designates a segment of track as “excepted track”, operations may continue over that segment of track without complying with the provisions of Subparts B, C, and D of the Saskatchewan Track Safety Standards.
  - vi) The Railway Company shall advise the Provincial Railway Inspector prior to removing the status of “excepted track.”
  - vii) On annual basis, track designated as “excepted track” must be re-evaluated by the railway company and a risk assessment report indicating that the track is safe for operations shall be provided to the Provincial Railway Inspector. The status of the track must also be confirmed in the report.

## **6. RESPONSIBILITY OF THE RAILWAY COMPANY**

- 6.1 Where a line of track is not in compliance with the requirements of these standards, the railway company shall:
- a) Bring the line into compliance; or
  - b) Reduce the Class of that line of track so that it is in compliance with the requirements of these standards; or
  - c) Halt operations over that line of track.
- 6.2 Notwithstanding subsection 6.1, in the case of Class 1 track that is not in compliance with these standards, the railway company may operate on that line of track under the authority of a track supervisor for not more than 30 days. 6.2 does not apply where defective rails are involved. Part II Subpart D Section IV (Defective Rails) of the Saskatchewan Track Safety Standards exclusively governs further operations over defective rails.
- 6.3 When any person, including a contractor for a railway company performs any function required by these rules, that person is required to perform that function in accordance with these rules.

## **7. RESTORATION OR RENEWAL OF TRACK UNDER TRAFFIC CONDITIONS**

- 7.1 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 section 9. 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 an extended area, it is not necessary that each phase of the work be done under the visual supervision of that person.

## **8. MEASURING TRACK NOT UNDER LOAD**

- 8.1 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.

## **9. TRACK SUPERVISORS**

- 9.1 Each railway company shall qualify persons to supervise restorations and renewals of track under traffic conditions. Such supervisors shall also be qualified to inspect track for defects.

## **10. TRACK INSPECTORS**

10.1 Each railway company shall qualify persons to inspect track for defects.

## **11. CERTIFICATES**

11.1 Every railway company shall issue to each track inspector and track supervisor who is employed by the company a wallet-size certificate indicating the name and occupational category of the certificate holder.

## **12. CERTIFICATION**

12.1 No railway company shall allow an employee of the company to perform the duties of a track inspector or track supervisor unless the employee has, to the satisfaction of the company, met the criteria established by the company.

12.2 It is recommended that each person certified have, at least 1 year of experience in railway track inspection or maintenance and training from a course in track inspection and maintenance.

12.3 A railway company shall maintain a record of all employees who have been certified.

## **13. TRACK INSPECTIONS**

- 13.1 A track inspector or track supervisor shall undertake track inspections at such a frequency and by such a method as to ensure that a line of track is safe for operation of a train at the authorized speed and authorized maximum loads.
- 13.2 A track inspection shall be performed by a professional engineer prior to increasing maximum speed and/or loads on a section of railway. The results of this inspection must be reported to the provincial inspector.

## **PART II – TRACK SAFETY STANDARDS**

### **SUBPART A – CLASSES OF TRACK:**

#### **Operating Speed Limits**

The following maximum allowable operating speeds apply (in miles per hour);

Over track that meets all of the requirements prescribed in this part for -	The maximum allowable operating speed for freight trains is -	The maximum allowable operating speed for passenger trains is -
Excepted Track	10	N/A
Class 1 Track	10	15
Class 2 Track	25	30
Class 3 Track	40	60
Class 4 Track	60	80
Class 5 Track	80	95

## **SUBPART B – ROADBED**

### **1. 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.

### **2. VEGETATION**

Vegetation on railway property that is on or immediately adjacent to the roadbed must be kept controlled so that it does not:

- (a) Become a fire hazard to track carrying structures;  
or
- (b) Obstruct visibility of railway signs and signals or crossings; or
- (c) Interfere with railway employees performing normal trackside duties; or
- (d) Prevent proper functioning of signal and communication lines; or
- (e) Prevent railway employees from visually inspecting moving equipment from their normal duty stations; or
- (f) Obstruct drainage.

## SUBPART C – TRACK GEOMETRY

### 1. SCOPE

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

### 2. GAUGE

Gauge 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.

Gauge, on tangent track and curves less than 12 degrees, must be within the limits prescribed in the following table:

Class of Track	The gauge must be at least -	But not more than -
Excepted	N/A	4'-10 1/4" (1 3/4" Wide)
1	4'- 8" (1/2" Narrow)	4'- 10" (1 1/2" Wide)
2 and 3	4'- 8" (1/2" Narrow)	4'- 9 3/4" (1 1/4" Wide)
4 and 5	4'- 8" (1/2" Narrow)	4'- 9 1/2" (1" Wide)

If the change in gauge over 20 feet on either side of the defective location exceeds  $\frac{7}{8}$ " , then speeds must be further reduced, according to the following table:

Change in gauge over 20ft. either side of site of narrow gauge	Maximum permissible speed in MPH	
	Freight	Passenger
More than 1 1/2"	10	15
More than 1 1/8"	25	30
More than 7/8"	40	60

### 3. ALIGNMENT

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

Class of Track	<b>Tangent Track</b> The deviation of the mid-offset from any 62 foot line <sup>1</sup> may not be more than -	<b>Curved Track</b> The deviation of the mid-ordinate from any 62 foot chord <sup>2</sup> may not be more than -
1	5 "	5 "
2	3 "	3 "
3	1 3/4"	1 3/4"
4	1 1/2"	1 1/2"
5	3/4"	5/8"

1. The ends of the line must be at points on the gauge side of the rail, five-eighths of an inch below the top of the rail head.
2. The ends of the chord must be at points on the gauge side of the outer rail, five-eighths of an inch below the top of the rail head.

#### **4. CURVES**

- (a) Except as provided in VI, the outside rail of a curve may not be lower than the inside rail of a curve or have more than 6" of elevation.
- (b) The maximum allowable operating speed for each curve is determined by the following formula:

$$V_{\max} = [(E_a+3)/0.0007d]^{1/2}$$

Where:

$V_{\max}$  = Max. allowable operating speed (mph)

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

$d$  = Degree of curvature (degrees)

#### **5. ELEVATION OF CURVED TRACK**

- (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 IV(b)
- (b) Elevation runoff must be at a uniform rate, within the limits of track surface deviation prescribed in VI, 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 the tangent track.

## 6. TRACK SURFACE

(a) Each owner of the track shall maintain the surface of its track within the limits prescribed in the following table:

Track Surface	Class of Track				
	1	2	3	4	5
The runoff in any 31 feet of rail at the end of a raise may not be more than -	3 1/2"	3"	2"	1 1/2"	1"
The deviation from uniform profile on rail at the mid-ordinate of a 62 foot chord may not be more than -	3"	2 3/4"	2 1/4"	2"	1 1/4"
Deviation from designated elevation on spirals may not be more than -	1 3/4"	1 1/2"	1 1/4"	1"	3/4"
Variation in cross level on spirals in any 31 feet may not be more than -	2"	1 3/4"	1 1/4"	1"	3/4"
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"	1 3/4"	1 1/4"	1"
The difference in cross level between any 2 point less than 62 feet apart on tangents and curves between spirals may not be more than-	3"	2"	1 3/4"	1 1/4"	1"

(b) To control harmonics on Class 2 through 5 jointed track with staggered joints, the cross level difference shall not exceed  $1\frac{1}{4}$  inches in all of six consecutive pairs of joints, as created by 7 low joints. Track with joints staggered less than 10 feet (3.048 m) shall not be considered as having staggered joints. Joints within the 7 low joints outside of the regular joint spacing shall not be considered as joints for purposes of this subsection. For 79 or 80 foot long rails, this subsection is not applicable.

## **7. INTERPOLATION OF SPEEDS BETWEEN TRACK CLASSES**

In the event that a track geometry-related defect is detected during a track geometry car inspection, the railways may, for a period of 72 hours after the inspection, use linear interpolation to determine the speed of the temporary slow order initiated to protect the defect. Records of slow orders imposed or reason for not imposing one must be maintained. Upon the expiration of the 72 hour period, if the track defect has not been repaired, the slow order speed(s) must be revised to those of the next lower track Class.

## **SUBPART D – TRACK STRUCTURE**

### **1. SCOPE**

This subpart prescribes the minimum requirements for ballast, crosstie, track assembly fittings, and the physical condition of rails.

### **2. BALLAST**

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 rolling equipment to the subgrade;
- (b) Restrain the track laterally, longitudinally, and vertically under dynamic loads imposed by rolling equipment and thermal stress exerted by the rails;
- (c) Provide adequate drainage for the track; and
- (d) Maintain proper track cross-level, surface and alignment.

### **3. CROSSTIES**

- (a) Crossties shall be made of material to which rail can be securely fastened.
- (b) Each 39 foot segment of track shall have:
  - (1) A sufficient number of crossties which in combination provide effective support that will:
    - (i) Hold gauge within limits prescribed in C.II;
    - (ii) Maintain surface within the limits prescribed in C.VI; and
    - (iii) Maintain alignment within the limits prescribed in C.III.
  - (2) The minimum number and type of crossties 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 Track shall have a minimum number of crossties as shown in the table below:

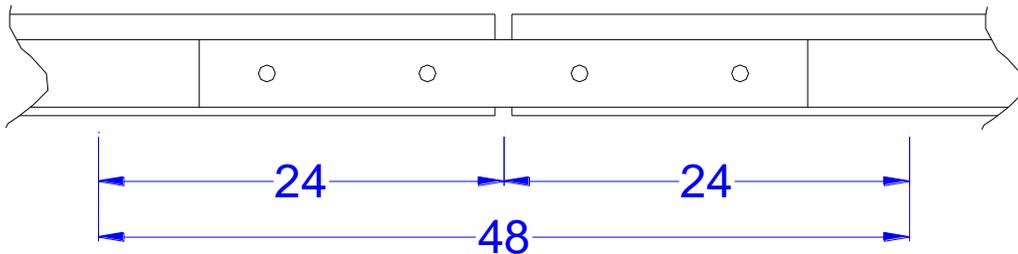
Track Class	Tangent Track and Curves $\leq 2^\circ$	Turnouts and Curves $>2^\circ$
1	5 crossties	6 crossties or switch ties
2	8 crossties	9 crossties or switch ties
3	10 crossties	12 crossties or switch ties
4	12 crossties	14 crossties or switch ties
5	12 crossties	14 crossties or switch ties

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  $\frac{1}{2}$  inch relative to the crosstie; or
- (4) Cut by the tie plate through more than 40% of the ties thickness.

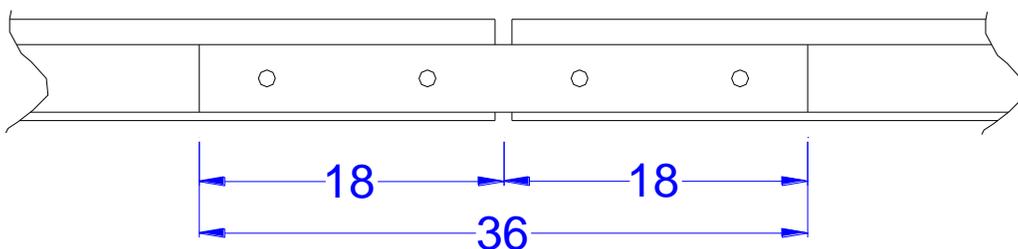
(d) Class 1 and Class 2 track shall have one crosstie whose centreline is within 24 inches of the rail joint location, and Class 3 through 5 track shall have one tie whose centreline is within 18 inches of the rail joint location. The relative position of these ties is described in the following diagrams:

Classes 1 and 2



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

Classes 3 through 5



Each rail joint in Classes 3 through 5 track shall be supported by at least one crosstie in paragraph (c) of this section whose centreline is within the 36" shown above.

(e) Where consecutive ties are defective, as described in (c) 1 through 4, the following restrictions shall apply:

<b>Defective Ties</b>	<b>Operating Restrictions</b>
0 to 2	No restrictions
3	Limit maximum operating speed to 10mph
4	Limit maximum operating speed to 5mph
5	No operations permitted

(f) At locations where centre-to-centre spacing of ties exceeds 48 inches, due to skew or movement of ties, no operations are permitted.

#### **4. DEFECTIVE RAILS**

(a) When a rail in track contains any of the defects listed in the following table, operation over the defective rail is not permitted until:

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

## REMEDIAL ACTION

Defect	Length of Defect (inches)		Cross-Section % weakened by defect		Remedial action if defective rail is not replaced
	More than	But not more than	Less than	But not less than	
Transverse Fissure			20% 100%	20% 100%	B B A
Compound Fissure			20% 100%	20% 100%	B B A
Detail Fracture			20%		C
Engine Burn Fracture			100%	20%	D
Defective Weld				100%	A or E &H
Horizontal Split Head	0" 2"	2" 4"			H & F I & G
Vertical Split Head	4" (1)	(1)			B A
Split Web	0"	1/2"			H & F
Piped Rail	1/2"	3"			I & G
Head/Web Separation	3" (1)	(1)			B A
Bolt Hole Crack	0" 1/2" 1 1/2" (1)	1/2" 1 1/2" (1)			H & F G B A
Broken Base	0"	6"			A or E & I
Ordinary Break					A or E
Damaged Rail					C

(1) Break out in Rail Head

- A) Assigned person to visually supervise each operation over defective rail.
- B) Limit operating speed over defect to that authorized by Track Supervisor.
- C) Apply joint bars bolted through outer holes to defect within 20 days of locating. On Class 3 through 6 track, limit operating speed over defect to 30mph before bar application and thereafter to 60 mph or maximum by class.
- D) Apply joint bars bolted through outer holes to defect within 10 days of locating. On Class 3 through 5 track, limit operating speed over defect to 30mph before bar application and thereafter to 60 mph or maximum by class, whichever is lower.
- E) Immediately apply joint bars to defect in accordance with VI (d) and (e).
- F) Inspect rail after 90 days to continue in use.
- G) Inspect rail after 30 days to continue in use.
- H) Limit operating speed over defective rail to 60mph or max per class, whichever is lower.
- I) Limit operating speed over defective rail to 30mph or max per class, whichever is lower.

(b) As used in this section:

- (1) **Transverse Fissure** means a progressive crosswise fracture starting from a crystalline centre 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 centre or nucleus and the nearly smooth 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 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 length 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.
- (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 which none of the other defects 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.

## 5. RAIL END MISMATCH

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

Class of Track	On the top of the rail ends (inch)	On the gauge 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. 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 Class 3 through 5 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 5 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 rail 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 section 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 hole may be used.

## **7. TIE PLATES**

In Classes 3 through 5 track where timber crossties are in use there must be tie plates under the running rails on at least 8 of every 10 consecutive ties.

## **8. RAIL ANCHORING**

A sufficient number of anchoring devices will be applied to provide adequate longitudinal restraint.

## **9. RAIL FASTENINGS**

Each 39 foot segment of rail shall have a sufficient number of fastenings to effectively maintain gauge within the limits prescribed in Subpart C. Section II.

## **10. CONTINUOUS WELED RAIL (CWR)**

Each railway company shall have comprehensive written instructions on proper installation and maintenance of CWR. These instructions shall be available upon request to the Provincial Inspector.

## **11. RAIL WEAR**

Each railway company shall have written requirements establishing maximum rail wear limits. These requirements shall be available upon request to Provincial Inspector.

## **12. 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 5 track must be equipped with rail anchors through and on each side of track crossings and turnouts, to restrain rail movements affecting the position of switch points and frogs.
- (c) Each flangeway at turnouts must be, at least, 1½ inches wide.

### 13. 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 closed positions, to allow wheels to pass the switch point. Lateral and vertical movement of a stock rail in the switch plates or of the switch plate on a tie must not adversely affect the fit of the switch point to the stock rail.
  - (i) if the switch can be thrown and locked in either direction with a 1/8" spacer between switch point and stock rail, operating speed over the switch may not be more than 10mph
  - (ii) if the switch can be thrown and locked in either direction with a 1/4" spacer between switch point and stock rail, no operations will be allowed over the switch.
- (c) Each switch must be maintained so that the outer edge of the wheel tread cannot contact the gauge side of the stock rail.
- (d) The heel of the switch rail must be kept 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.

#### **14. 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 3/8 inches, or less than 1 1/2 inches on Classes 2 through 5 track.
- (b) If a frog point is chipped, broken, or worn more than 5/8 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 3/8 inch below the original contour operating speed over that frog may not be more than 10 miles per hour.

## **15. SPRING RAIL FROGS**

- (a) The outer edge of a wheel tread may not contact the gauge 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 tension sufficient to hold the wing rail against the point rail.
- (e) The clearance between the hold-down housing and the horn may not be more than  $\frac{1}{4}$  inches.

## **16. SELF GUARDED FROGS**

- (a) The raised guard on a self-guarded frog may not be worn more than  $\frac{3}{8}$  inches.
- (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.

## 17. FROG GUARD RAILS

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

Class of Track	<b>Guard check gauge</b> The distance between the gauge line of a frog to the guard line of its guard rail or guarding face, measured across the track at right angles to the gauge line, may not be less than -
1	4'-6 1/8"
2	4'-6 1/4"
3,4	4'-6 3/8"
5	4'-6 1/2"

## **18. BRIDGES**

- (a) Bridges must be capable of safely carrying the loads for which they are rated.
- (b) If critical structural components show indications of damaged or signs of cracking, warp, or deterioration:
  - (i) operating speed over the bridge must be reduced to 10mph, and
  - (ii) the bridge must be inspected by a professional engineer.
- (c) If track on bridges is out of alignment due to movement of the bridge structure, or for unknown reasons:
  - (i) operating speed over the bridge must be reduced to 10mph, and
  - (ii) the bridge must be inspected by a professional engineer.
- (d) Speeds that have been reduced in accordance with this clause may only be increased with the approval of a professional engineer.
- (e) Debris built up around piers or pilings in streams or drainage channels must be removed.
- (f) Rail anchors are not to be installed on track over open deck bridges, unless specifically designed for anchors by the railway company engineer.

## **19. CULVERTS**

- (a) Culverts must be capable of handling expected maximum water flows.
- (b) Culverts inlets and outlets must be clear of debris and project beyond the roadbed embankment.
- (c) Culverts must form a continuous conduit without breaks or separations.

## **20. GRADE CROSSINGS**

- (a) Grade crossings must allow for safe passage of vehicles typical to the crossing.
- (b) Grade crossings must have sufficient clear sight distances, or protection, to allow drivers to recognize and react to any threat of collision.
- (c) Grade crossings with automatic protection that does not function properly:
  - (i) must be repaired prior to a train using that crossing, or
  - (ii) must be protected manually during a train crossing.

## **SUBPART E – TRACK APPLIANCES AND TRACK RELATED DEVICES**

### **1. SCOPE**

This subpart prescribes the minimum requirements for certain track appliance and track related devices.

### **2. DERAILS**

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.

Deraills must be installed when there is any possibility of equipment that has been left standing on tracks other than main tracks or sidings being moved so as to obstruct a main track or siding.

### 3. SIGNAGE

Track signage must be clearly visible and located at appropriate locations.

If signage is unclear, known to be missing or damaged, operating speed must be reduced to Restricted Speed, until the entire train has passed through the area in question.

Track signage is required to identify the following features, required actions and hazards:

#### a) Features

<b>Sign</b>	<b>Description</b>
Mile Post	Mile points on subdivision
No Trespassing	Areas having high risk of trespassers

#### b) Maintenance of Way

<b>Sign</b>	<b>Description</b>
Maint. Limit	Define limits of track ownership
Structure	Bridge or Culvert
Snowplow	Warning to lift flanger or close wings

c) Operational

<b>Sign</b>	<b>Description</b>
Speed Control	Temporary and permanent speed changes
Whistle Posts	Whistle application required start point
Location	Yard limits, De-rail position

d) Safety Hazard

<b>Sign</b>	<b>Description</b>
Restricted Clearance	Low height of close side clearances
Electrical Hazard	Overhead electrical wires
Track Crossing	Grade crossing of multiple tracks without automatic protection

## **SUBPART F – INSPECTION**

### **1. SCOPE**

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

### **2. TRACK INSPECTIONS**

- (a) All track must be inspected in accordance with the Railway Company's Safety Management Plan, as filed with the province. This inspection schedule shall not require fewer inspections than prescribed in paragraph (c) of this section.
- (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 the 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. When riding over the track in a vehicle, the inspector(s) may inspect up to 2 tracks at one time provided that:

- (i) Each main track is actually traversed by the vehicle or inspected on foot on alternate inspections at least once every two weeks, and each siding is actually traversed by the vehicle or inspected on foot at least once every month.
- (ii) One inspector cannot inspect more than two tracks at one time and cannot inspect any track centred more than 30 feet from the track on which the inspector is riding.
- (iii) Track inspection records must indicate all track(s) included in the inspection and indicate which track(s) was traversed by the vehicle or inspected on foot.
- (iv) The inspectors' view of the tracks is unobstructed by tunnels, bridges, differences in ground level, or any other circumstances or conditions that would interfere with clear view of all tracks they are inspecting.

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

Class of Track	Type of Track	Required Frequency with Geometry Car Inspection	Required Frequency without Geometry Car Inspection
1,2,3	Main	<p>Weekly with at least 3 calendar days interval between inspections or before use if the track is used less than once a week.,</p> <p>or;</p> <p>Twice weekly with at least 2 calendar days interval between inspections, if the track carries passenger trains or more than 3M gross tons of traffic during the preceding 12 months</p>	<p>As required with a maximum interval of 3 calendar days between inspections and train operations,</p> <p>or;</p> <p>As required with a maximum interval of 2 calendar days between inspection and train operations if the track carries passenger trains or more than 3M gross tons of traffic during the preceding 12 months</p>

Class of Track	Type of Track	Required Frequency with Geometry Car Inspection	Required Frequency without Geometry Car Inspection
4,5	Main	Twice weekly with at least 2 calendar days interval between inspections	N/A
Siding		To be inspected from the adjacent main track during main track inspections as stipulated above.	
		Once each month, with at least 20 days between inspections, each siding must be actually traversed by the inspection vehicle, or else inspected on foot	
Other (Yard Track or Industrial Track)		Monthly with at least 20 calendar days interval between inspections, or before use if the track is used less than once a month	

NOTE: Geometry car Inspections to be conducted at the minimum frequency outlined in F. III.

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

### **3. Electronic Geometry Inspections**

(a) An Electronic Geometry Inspection vehicle is an automated track inspection vehicle used to measure, calculate and record geometric parameters of the track. Two types of track geometry inspection vehicles defined below can be used to measure and evaluate track geometry.

(b) Light Geometry Inspection Vehicle (LGIV)

(i) A Light Geometry Inspection Vehicle (LGIV) must be capable of measuring:

1. Alignment / Curvature
2. Super elevation / Cross level
3. Gauge
4. Railway Track Safety Rule parameters calculated from these measurements

(ii) Track measurements obtained with these vehicles are considered static geometry measurements, as the vertical load applied to the track is limited to the weight of the hirail vehicle. Allowances must be made for any condition that could result in a greater measurement when the track is under load.

(c) Heavy Geometry Inspection Vehicle (HGIV)

(i) A Heavy Geometry Inspection Vehicle (HGIV) must have a vertical wheel load of 10,000 pounds and be capable of measuring:

1. Surface / Longitudinal Profile
2. Alignment / Curvature

3. Super elevation / Cross level
4. Gauge
5. Railway Track Safety Rule parameters calculated from these measurements

(ii) Track measurements obtained with these vehicles are considered dynamic geometry measurements representative of the track in a loaded condition.

(d) An Electronic Geometry Inspection of all Main Track must meet the minimum frequency:

Class of Track	Annual Frequency Requirement		
	< 1 MGT	1 - 5 MGT	>5 MGT
Class 1	N/A	N/A	LGIV – Once
Class 2	N/A	LGIV – Once	LGIV – Twice Or HGIV – Once
Class 2 (TDG)	LGIV – Once	LGIV – Twice Or HGIV – Once	LGIV – Three Times Or HGIV – Twice
Class 3,4,5	LGIV – Twice Or HGIV – Once	HGIV – Once	HGIV – Twice

NOTE: “Class 2 (TDG)” applies to railways that operate over class 2 track and possess an operating certificate that permits the transportation of dangerous goods (TDG). If a railway does not have TDG designation on their operating certificate, “Class 2” frequency requirements should be applied to class 2 track.

- (e) If a portion of track cannot be inspected at the required interval, the railway must, before the expiration of time or tonnage limits:
  - (i) Inspect that segment of track with a light geometry inspection vehicle and be governed by the results of that inspection or perform an additional visual inspection per week until the required track geometry inspection frequency can be met and, in the case of Class 3 track or higher, the next required track geometry inspection must be completed with a heavy geometry inspection vehicle, or;
  - (ii) Reduce class of track to bring the track into compliance until such time as a valid track geometry inspection can be made.

#### **4. 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.
- (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.

## **5. INSPECTION OF RAIL**

- (a) In addition to the track inspections required by F.II, at least once a year a continuous search of internal defects must be made of all jointed and welded rails in Classes 4 and 5 track, in tracks where the annual gross tonnage is 25 million or more and in 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, in the area enclosed by the joint bars.
- (c) Each defective rail must be marked with a highly visible marking on both sides of the web and base.

## **6. BRIDGE INSPECTIONS**

- (a) All bridge structures must be visually inspected at least once a year by a Track Supervisor.
- (b) Inspections must include a visual inspection of the bridge deck, dump-walls and wing-walls, stringers, pile caps, piers and piles, and bearings.
- (c) Bridge structures exhibiting track movement or component wear in excess of that noted on previous inspections must be inspected by a professional engineer.

## **7. CULVERT INSPECTIONS**

- (a) All culverts must be visually inspected every year to ensure that they will allow passage of required flows.
- (b) Culverts that have partially or fully collapsed or are allowing the inflow of soil or rock:
  - (i) must be repaired or replaced as soon as possible.
  - (ii) must be monitored and inspected monthly until they are repaired or replaced.

## **8. CROSSING INSPECTIONS**

- (a) All grade crossings must be visually inspected during every track inspection.
- (b) Automatic protection at grade crossings must be tested during every track inspection (or weekly if track is inspected more frequently) to ensure that the warning systems are functioning properly.  
Testing includes:
  - (i) trigger crossing protection manually,
  - (ii) inspect lights to ensure operation,
  - (iii) check for misalignment of lights,
  - (iv) verify operation of bells,
  - (v) verify operation of gates or other protection equipment where applicable.

## **9. SPECIAL INSPECTIONS**

In the event of fire, flood, severe storm or other occurrence that might have damaged track structure, a special inspection must be made of the track involved as soon as possible after the occurrence.

## **10. INSPECTIONS RECORDS**

- (a) Each owner of a track to which this part applies shall keep a record of each inspection required on that track under this subpart.
- (b) Each record of an inspection under Section F 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) All records (track geometry car, rail testing car, inspection logbooks, etc.) shall be made available upon request to Provincial Inspectors.



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