



Railway Freight & Passenger Train Brakes Rules

October 25th, 1994 (TC O-07-01)



Transport
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RAILWAY FREIGHT AND PASSENGER TRAIN BRAKE RULES

PART I – GENERAL

1. Short Title
2. Scope
3. Definitions
4. Qualifications and Compliance of Railway Employees
5. Pre-departure Requirements for Locomotives
6. Pre-departure Requirements for Trains
7. Operating Requirements
8. Exceptions
9. Communicating Signal System

PART II – BRAKE TEST REQUIREMENTS

10. General
11. No. 1 Brake Test
12. No. 1-A Brake Test
13. No. 2 Brake Test
14. No. 3 Brake Test
15. Train Information Braking System (TIBS) Test
16. Transfer Movement Brake Test
17. Push-Pull Operation
18. Portable Locomotive Remote Control Operation
19. Back-Up Hose or Valve
20. Snowplow Train Brake Test

PART III – EQUIPMENT REQUIREMENTS

21. Maintenance
22. Brake Cylinder Piston Travel
23. Locomotive Feed Valves and Pressure Settings

PART IV – FILING REQUIREMENTS

24. Filing Requirements with the Department

PART I - GENERAL

1. **SHORT TITLE**

- 1.1 For ease of reference, this rule may be referred to as the "Train Brake Rules".

2. **SCOPE**

- 2.1 These Rules are intended to ensure the safe operation of brakes on all freight and passenger trains operating in Canada. These rules apply to all railway companies subject to the jurisdiction of Transport Canada pursuant to the *Railway Safety Act*.

3. **DEFINITIONS**

In these Rules:

- 3.1 "bad order card" means a railway company form which is affixed to a freight car to indicate maintenance requirements, upon which brake defects identified during a brake test may be recorded;
- 3.2 "brakes" means pneumatic (air), electro-pneumatic or hydro-pneumatic brake systems;
- 3.3 "brake test" means a test made for the purpose of establishing that the brake system functions as intended, as outlined in Part II of these rules and railway company instructions;
- 3.4 "calibrated" means an indication on the air flow indicator at a position that corresponds to a flow of air into the brake pipe of 60 cubic feet per minute;
- 3.5 "certified car inspector" means a person who is trained and qualified to inspect and maintain car brake equipment;
- 3.6 "communicating signal" system means a system which enables the train crew to communicate with the locomotive engineer in a passenger train;

- 3.7 "continuity" means capability of transmitting a signal between the controlling locomotive and the rear car of a train;
- 3.8 "Department" means the Department of Transport, Surface Group;
- 3.9 "equipment" means locomotives, cars and any other vehicles designed to operate in trains;
- 3.10 "locomotive" means a unit propelled by any energy form;
- 3.11 "locomotive consist" means a combination of locomotives operated from a single control;
- 3.12 "operative" means a brake that applies and releases and is in a suitable condition to retard and/or stop equipment;
- 3.13 "portable locomotive control device" means a device, carried by a qualified person at trackside or other suitable location, which is a component part of a system for remotely operating locomotive throttle and brake controls;
- 3.14 "psi" means pressure in pounds per square inch;
- 3.15 "pull-by inspection" means a visual examination of the brakes made while the train is in motion at a speed not exceeding 8 kilometers per hour (5 miles per hour);
- 3.16 "qualified person" means, in respect of a specified duty, a person who, because of his/her knowledge, training and experience, is qualified to perform that duty safely and properly. For example, a certified car inspector is qualified to inspect and maintain car brake equipment. Train crews are qualified to inspect brake equipment;
- 3.17 "railway company" means a railway or railway company subject to the *Railway Safety Act*;
- 3.18 "railway safety inspector" means a Department of Transport inspector appointed pursuant to section 27 of the *Railway Safety Act*;
- 3.19 "running brake test" means a test of brakes made on a moving passenger train to ascertain that the brakes are operating;

- 3.20 "safety control" means device(s) which will cause a brake application to be initiated automatically if the locomotive engineer becomes incapacitated;
- 3.21 "safety inspection location" means a location designated by a railway company where certified car inspectors perform inspection and testing of train brakes;
- 3.22 "terminal area" means a location that includes one or more yards together with the tracks connecting the yard or yards and industries within that area;
- 3.23 "TIBS" or Train Information Braking System means a system for communicating brake pipe pressure between the controlling locomotive and the last car in the train, which includes a rear of train emergency braking feature and, if the train is otherwise unequipped, a distance measuring device;
- 3.24 "train" means locomotive(s) with or without cars, or a track unit(s) so designated by its operating authority displaying marker(s);
- 3.25 "train brake status system" means any method, computerized or otherwise, (i.e. in hard copy), by which a railway company maintains information on the status of train brake inspections;
- 3.26 "transfer movement" means a movement over main tracks between yards and/or industrial areas within a terminal area;
- 3.27 "yard test plant" means equipment, either fixed or mobile, used to supply and control compressed air to operate the brakes on equipment in a yard.

4. QUALIFICATION AND COMPLIANCE OF RAILWAY EMPLOYEES

- 4.1 A railway company shall ensure that all employees engaged in the operation or inspection of trains:
 - (a) are fully conversant with the requirements of these Rules and railway company instructions; and
 - (b) comply with these Rules and railway company instructions when operating trains or when engaged in the inspection and testing of brakes, associated control devices, safety controls and communicating signal systems.

5. PRE-DEPARTURE REQUIREMENTS FOR LOCOMOTIVES

- 5.1 At a location where a locomotive has been laid over, altered or repaired, a qualified person shall test brakes, associated radio/electronic control devices, safety controls and communication signal systems to determine that these systems are functioning properly.
- 5.2 If the testing is performed by other than the locomotive engineer, the results of the tests shall:
- (a) be made available to the locomotive engineer; and
 - (b) be retained on record for 30 days.

6. PRE-DEPARTURE REQUIREMENTS FOR TRAINS

- 6.1 A train shall not depart from a safety inspection location or a terminal area until the appropriate brake tests as outlined in Part II of these Rules and railway company instructions have been completed.
- 6.2 The tests will be performed by qualified persons, who will report the test results in the manner prescribed by the railway company to the train brake status system. Any brake system defect discovered during the brake test shall be repaired if reasonable and practicable. Any brake system defect discovered during the brake test and not repaired prior to departure shall be reported to the conductor, or in his/her absence, the locomotive engineer, who shall update the train brake status system.
- 6.3 If the testing is performed by certified car inspectors, the results of the tests will be retained for 30 days.
- 6.4 The conductor, or in his/her absence, the locomotive engineer, shall be responsible for determining that the prescribed test has been completed prior to departure. A pull-by inspection for brake release is acceptable. In such case, the conductor or locomotive engineer, shall be provided with the results of the release, and in turn, will update the train brake status system.

7. OPERATING REQUIREMENTS

- 7.1 At a safety inspection location, a train shall not be dispatched:
- (a) from a location where a train is made up, unless a minimum of 95 percent of train brakes are operative;
 - (b) from a location where cars are added, unless a minimum of 95 percent of brakes on those cars added are operative.
- This requirement does not apply to cars referred to in sections 8.4 and 8.5.
- 7.2 No freight train shall be operated with less than 85 percent of the train brakes operative, except as provided in section 8.4.
- 7.3 A passenger train shall not be operated with less than 85 percent of the train brakes operative unless appropriate reduction in train speed, as determined by the locomotive engineer, is made.
- 7.4 Brakes shall be operated from the lead locomotive.
- 7.5 When a train experiences a brake system or a safety control malfunction en route which cannot be readily corrected, the conductor, or in his/her absence, the locomotive engineer, shall report the location, date, time and description of the malfunction. Appropriate action, as prescribed by the railway company, will be taken by the locomotive engineer, including:
- (a) if the leading locomotive ceases to control the train en route, a No. 3 Brake Test shall be made from the controlling locomotive, and thereafter, as soon as practicable, the controlling locomotive will be placed in the lead position;
 - (b) if the safety control on the controlling locomotive becomes inoperative while a train is en route, it may be cut out and, as soon as practicable, corrective action shall be taken to either repair the safety control or change the locomotive.
- 7.6 A railway company shall designate to its employees the territory in which pressure retaining valves shall be used.
- 7.7 A running brake test of passenger train brakes shall be made after leaving any location where the crew is changed.

7.8 The locomotive engineer and the conductor shall be provided with the initial brake test results and en route updates of the status of the train brakes.

8. EXCEPTIONS

8.1 A car found to have inoperative brakes at a safety inspection location or while en route in a train may remain in the train provided all the following requirements are observed:

(a) where appropriate, the brakes of the car or the affected truck shall be cut out;

(b) no more than two cars with inoperative brakes shall be coupled together; and

(c) there shall be a minimum of three cars with operative brakes at the rear of a freight train, except as provided in section 8.6.

8.2 A railway company shall control and protect the movement of a car with inoperative brakes with a train brake status system. This may include the use of a bad order card.

8.3 The conductor, or in his/her absence, the locomotive engineer, shall be notified of cars with inoperative brakes in the train, and in turn, is responsible to ensure the train brake status system referred to in section 8.2 is updated.

8.4 Cars or locomotives with brakes inoperative due to damage may be moved in a train when authorized by a person in charge. This person is appointed by a railway company to ensure the safe conduct of an operation or of the work of employees. The person in charge will ensure that appropriate measures have been taken to move such equipment safely.

8.5 On trains of 18 cars or less, when it is impractical to comply with section 7.1(a) of these rules, a train may proceed with equipment that has inoperative brakes, provided the conductor and locomotive engineer are advised of the placement of such equipment in their train, and that appropriate action, such as the reduction of train speed, is taken so as to ensure safe operation, and the requirements of section 7.2 are not exceeded.

- 8.6 Scale test cars without brakes may be moved in a freight train provided they are placed ahead of the rear car of the train and they are coupled to cars with operative brakes.
- 8.7 Other railway equipment without brakes, because of design, may operate in a freight train provided the equipment is identified to the Department.
- 8.8 A test car may be moved at the rear of a freight train for test purposes, provided it is coupled to a car with operative brakes.

9. COMMUNICATING SIGNAL SYSTEM

- 9.1 If a communicating signal system is used:
 - (a) the system shall be tested for continuity and shall be in operating condition before the train leaves a safety inspection location;
 - (b) at each location where the communicating signal system has been disconnected, or continuity interrupted, continuity shall be restored; and
 - (c) the conductor shall be notified immediately should any part of the communicating signal system become defective en route.

PART II - BRAKE TEST REQUIREMENTS

10. GENERAL

10.1 Brake tests shall be performed on every train as specified in these Rules by:

- (a) the Brake Pipe Leakage method; or
- (b) the Air Flow Method for trains with a controlling locomotive that is equipped with 26-L or equivalent brake equipment and a calibrated brake pipe flow indicator.

11. NO. 1 BRAKE TEST

11.1 A No. 1 brake test shall verify:

- (a) the integrity and continuity of the brake pipe;
- (b) the condition of the brake rigging on each car in the train;
- (c) the application and release of each car brake; and
- (d) that piston travel on each car is within limits.

11.2 A No. 1 brake test shall be performed by a certified car inspector where a train is made up at a safety inspection location and while en route at the subsequent safety inspection location(s) designated by the railway company for that train.

11.3 If a train is made up at other than a safety inspection location, a No. 1 Brake test will be performed at the first safety inspection location designated for that train by the railway company in the direction of travel.

11.4 A No. 1 Brake Test is not required at an interchange point when the locomotive engineer has access to records which indicate that a No. 1 Brake Test or an acceptable equivalent has been successfully performed on that train prior to its arrival at the interchange point.

12. NO. 1-A BRAKE TEST

12.1 A No. 1-A brake test shall verify:

- (a) the integrity and continuity of the brake pipe; and
- (b) the application and release of each car brake.

12.2 A No. 1-A brake test shall be performed by qualified persons where a train is made up at other than a safety inspection location.

13. NO. 2 BRAKE TEST

13.1 A No. 2 brake test shall verify:

- (a) the integrity and continuity of the brake pipe; and
- (b) the application and release of each car added to the train.

13.2 A No. 2 brake test shall be performed by qualified persons when:

- (a) cars which have not been previously tested at that location are added to a train; or
- (b) the locomotive engineer has been changed.

14. NO. 3 BRAKE TEST

14.1 The No. 3 brake test shall verify the continuity of the brake pipe.

14.2 A No. 3 Brake Test shall be performed by qualified persons when:

- (a) solid blocks of cars which have received a No. 1 Brake test, as further defined in railway schedules, are added to a train;
- (b) the controlling locomotive has been attached to a train having received a No. 1 Brake Test; or
- (c) the locomotive consist has been exchanged or altered.

- 14.3 When the brake pipe has been uncoupled to set off cars or to perform switching and when cars have not been added to the train, it will only be necessary to re-couple the brake pipe and establish continuity.

15. TRAIN INFORMATION BRAKING SYSTEM (TIBS) TEST

- 15.1 TIBS test shall verify that an emergency brake application, initiated from the controlling locomotive through the TIBS system, will cause an emergency brake application on the last car of the train. When the sense and braking component of the TIBS system is added to a train, the operation of TIBS will be verified by qualified persons in accordance with railway company instructions referred to in part IV, section 24 of these rules.

16. TRANSFER MOVEMENT BRAKE TEST

- 16.1 A transfer movement brake test shall verify:
- (a) the integrity and continuity of the brake pipe;
 - (b) the application and release of the rear car of the movement; and
 - (c) that not less than 85 percent of the brakes are operative.
- 16.2 A transfer movement brake test is required if train speeds are expected to exceed 15 mph, providing:
- (a) where there are more than two cars with inoperative brakes, no more than two such cars shall be coupled together; and
 - (b) there shall be a minimum of three cars with operative brakes at the rear of a transfer movement.
- 16.3 On transfer movements traveling very short distances, where it is impractical to comply with section 16.2 and train speeds will remain below 15 mph, no brake test is required provided there are sufficient operative brakes to control the movement. Transfer movements traveling at speeds below 15 mph that contain dangerous goods in the consist must have air applied throughout the train.

17. PUSH-PULL OPERATION

17.1 On a train operated in a push-pull mode, a No. 3 brake test must be made from the controlling cab after changing ends.

18. PORTABLE LOCOMOTIVE REMOTE CONTROL OPERATION

18.1 The portable Locomotive Remote Control Operation shall verify:

- (a) that the train brakes apply and release;
- (b) the response of the emergency function; and
- (c) that should the qualified person become incapacitated, the brakes will apply and nullify the transmission of power to the locomotive traction motors (Tilt Test).

18.2 On a train which will involve control of the brakes by means of a portable locomotive control device, all safety procedures prescribed by the railway company must have been completed prior to departure.

19. TRAINS USING BACK-UP HOSE OR VALVE

19.1 Before starting a train from any point where the brakes are to be controlled by the use of a back-up hose or valve at the rear of the train, the brakes shall be applied by using the back-up hose or valve.

20. SNOW PLOW TRAIN BRAKE TEST

20.1 Following the appropriate train brake test, as outlined previously in this Part, and before starting a snowplow operation, an emergency application of train brakes shall be obtained from the operator's cab of the snowplow.

PART III - EQUIPMENT REQUIREMENTS

21. MAINTENANCE

- 21.1 All brake equipment shall be maintained in a safe and serviceable condition.
- (a) car brakes shall be maintained according to AAR requirements and railway company procedures; and
 - (b) locomotive brakes shall be maintained according to procedures issued by the railway company.
- 21.2 On each locomotive or self-propelled equipment, the date of testing or cleaning of brake equipment and the name of the shop or station at which the work was done shall be retained in the cab.
- 21.3 Yard Test Plant test equipment shall be cleaned, repaired and tested as often as required to maintain safe and satisfactory operation.

22. BRAKE CYLINDER PISTON TRAVEL

- 22.1 A car with a body-mounted brake cylinder has piston travel out of adjustment when:
- (a) piston travel is less than 7 inches (180 mm) or more than 9 inches (230 mm) on a passenger car; and
 - (b) piston travel is less than 6 inches (150 mm) or more than 9 inches (230 mm) on a freight car.
- 22.2 A car with truck-mounted brake cylinders, shall have piston travel, unless otherwise governed by design, sufficient to provide brake shoe clearance when the brake is released. On a passenger car, piston travel shall not exceed 6 inches (150 mm). On a freight car, piston travel shall not exceed 5 inches (125 mm).
- 22.3 A freight car with a special type of brake equipment not covered by the above shall have piston travel adjusted as indicated on the badge plate or stenciling applied in a conspicuous location near the brake cylinder.

22.4 On a locomotive, the maximum physical limit of brake cylinder piston travel will be indicated in the cab. In operation, piston travel must not come within two inches (50 mm) of the limit.

23. LOCOMOTIVE FEED VALVES AND PRESSURE SETTINGS

23.1 Air pressure feed valves shall be adjusted to the following pressures:

- | | |
|---|---------------------------------|
| (a) Minimum brake pipe pressure with automatic
brake valve in release position: | psi |
| - Freight service | 70 |
| - Passenger service | 90 |
| (b) Minimum differential between the brake pipe and
main reservoir air pressures with the brake valve
handle in release position .. | 15 |
| (c) Independent brake cylinder pressure
(Full application pressure) | As
posted
in cab |

PART IV - FILING REQUIREMENTS

24. FILING REQUIREMENTS WITH THE DEPARTMENT

- 24.1 A railway company shall file with the Department, railway schedules that indicate the safety inspection locations and terminal areas where the required brake tests are performed, to comply with section 6.1. Any changes to the safety inspection locations shall be filed by the railway company with the Department 60 days prior to implementing such changes.
- 24.2 A railway company shall file with the Department, the following procedures and tests, as amended from time to time, that it plans to use:
- (a) Train brake tests;
 - (b) Locomotive functional brake test;
 - (c) Calibration of locomotive brake pipe flow indicator/meter;
 - (d) Train information braking system - emergency air brake at tail end of train initiated from the head end;
 - (e) Single Car Test;
 - (f) Trains having a supplementary source of air supply at a location other than the head end locomotives;
 - (g) Work service equipment;
 - (h) Portable locomotive control device.
- 24.3 A railway company may operate trains with advanced technological/operational improvements or museum trains, provided that the testing and operating procedures have been filed with the Department, 30 days prior to testing or placing in service.