



# **Railway Freight and Passenger Train Brake Inspection and Safety Rules (TC O 0-95)**

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**Transport  
Canada**   **Transports  
Canada**

**Canada**

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## **PART I – GENERAL**

### **1. SHORT TITLE**

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

### **2. SCOPE**

- 2.1 These Rules prescribe the minimum safety standards for the safe operation of train brakes on all freight and passenger trains operated by a railway company subject to the jurisdiction of Transport Canada pursuant to the *Railway Safety Act*.

### **3. DEFINITIONS**

In these Rules:

- 3.1 “bad order” means railway equipment that has been identified with a defect.
- 3.2 "bad order card" means a railway company form that is affixed to railway equipment to indicate repair or maintenance requirements.
- 3.3 "bad order information system" means any method by which a railway company can monitor, control and protect the movement of railway equipment identified with defects.
- 3.4 “block of cars” means two (2) or more cars that have previously received a No.1 or No.1A brake test, as a solid coupled block, for which a record is available.
- 3.5 “block swap” means the addition to a train of a maximum of two (2) solid coupled block(s) of cars that have previously received a No.1 brake test.
- 3.6 "brakes" means pneumatic (air) or electronically controlled pneumatic (ECP) brake systems.
- 3.7 “brake indicator device” means any device used to indicate the application and release of the brakes when the piston is not visible.
- 3.8 “brake system defect” means a defective or inoperative brake component that prevents the brake system from functioning as intended.
- 3.9 "brake test" means a test performed for the purpose of establishing that the brake system functions as intended, as outlined in Part II of these Rules and railway company procedures/work instructions.

- 3.10 “cab control car” means a railway vehicle without propelling motors with one or more control stands.
- 3.11 "calibrated" means an indication on the airflow indicator at a position that corresponds to a flow of air into the brake pipe of sixty (60) cubic feet (one point seven (1.7) cubic metres) per minute.
- 3.12 "certified car inspector" means a person who is trained, qualified and certified to inspect and maintain car brake equipment.
- 3.13 "continuity" means the capability of transmitting a signal between the leading locomotive and the rear of the last piece of equipment of a train.
- 3.14 “Department” means the Department of Transport.
- 3.15 “equipment” or “railway equipment” means railway locomotives, freight cars, passenger cars, cabooses or service equipment operating in a train or transfer.
- 3.16 “integrity” means having the unimpaired capability to supply air to the rear of the last piece of equipment of a train.
- 3.17 “interchange" means the transfer of railway equipment between railway companies.
- 3.18 “lift” means the addition to a train of a solid coupled block of cars that have previously received a No.1A brake test at that location.
- 3.19 "locomotive or engine” means a rail vehicle propelled by any energy form, intended for the propulsion and/or control of freight, passenger or service equipment.
- 3.20 "locomotive consist" means a combination of locomotives operated from a single control.
- 3.21 “modified tilt test” means a test of the portable locomotive remote control device in which the operator control unit is tilted until an alarm is generated.
- 3.22 "operative" means a brake that applies and releases and is in a suitable condition to retard and/or stop equipment.
- 3.23 “person in charge” means a person certified in accordance with Section 4 of these Rules, appointed by a railway company to ensure the safe conduct of a railway operation.
- 3.24 “portable locomotive remote control device” means a device that is a component part of a system for remotely operating a locomotive(s).
- 3.25 "psi" means pressure in pounds per square inch (“kpa” means the equivalent to 1000 newtons per square metre).

- 3.26 "pull-by inspection" means a visual examination, by a stationary qualified person, of a train operating at a speed not exceeding five (5) miles per hour (mph) (eight (8) kilometres per hour (km/h)) to verify that all brakes have released.
- 3.27 "push-pull operation" means a train operation in which the control of the train can be from either end.
- 3.28 "qualified person" means in respect of a specified duty, a person who, because of knowledge, training and experience, is qualified to perform that duty safely and properly.
- 3.29 "railway company" means a railway or railway company subject to the *Railway Safety Act*.
- 3.30 "railway safety inspector" means a Department of Transport inspector designated pursuant to Section 27 of the *Railway Safety Act*.
- 3.31 "railway schedule" means an electronic or paper record that indicates the type of inspection, brake test and operational activity performed by a railway and the location where the activity is performed.
- 3.32 "running brake test" means a test of brakes performed on a moving train to ascertain that the brakes are operational.
- 3.33 "safety control" means a device(s) that will cause a brake application to be initiated automatically if the locomotive operator becomes incapacitated.
- 3.34 "safety inspection location" means a location designated by a railway company where certified car inspectors perform an inspection and testing of train brakes.
- 3.35 "train information breaking system" (TIBS) means a system with rear and front of train radio communication components capable of:
- a) monitoring and displaying brake pipe pressure on the rear car; and
  - b) calculating and displaying distance measurement; and
  - c) initiating an emergency brake application at the rear of the train from the head end.
- 3.36 "train" means an engine that is intended to operate at speeds greater than fifteen (15) mph (twenty-five (25) km/h):
- a) without cars; or
  - b) with cars and equipped with TIBS or a remote control locomotive at the rear; or
  - c) with cars including a caboose occupied by a crew member; or
  - d) with cars in passenger service.

- 3.37 “train brake status system” means any method by which a railway company maintains information on the status of train brake inspections.
- 3.38 “Transfer” means an engine with cars operating on main track at speeds not exceeding fifteen (15) mph (twenty-five 25 km/h) and need not be TIBS equipped.
- 3.39 "train brake test device" means equipment, either fixed or mobile, used to control the supply of compressed air to operate the brakes on railway equipment.

#### **4. CERTIFICATION OF CAR INSPECTORS**

- 4.1 A railway company shall ensure that its certified car inspectors are trained and qualified to perform brake tests on freight and/or passenger cars and trains and perform associated repairs in compliance with these Rules and in accordance with company procedures/work instructions, and all amendments, as filed with the Department. Certified car inspectors shall be conversant with these Rules and be able to demonstrate to a railway company, by means of oral or written examinations and on-the-job performance, a knowledge and ability concerning the performance of brake tests and associated repairs.
- 4.2 A railway company shall file with the Department a full description of the training program, criteria and all amendments used for certifying car inspectors.
- 4.3 A railway company shall maintain a record of all certified car inspectors. This record shall be made available to a railway safety inspector upon request.
- 4.4 Certified car inspectors shall be re-certified if they have not been performing the duties prescribed in these Rules within the past three (3) years.

#### **5. QUALIFIED PERSONS**

- 5.1 A railway company shall ensure that its qualified persons are trained and qualified to perform the inspection and testing of brakes, associated control devices and safety controls in compliance with these Rules and in accordance with company procedures/work instructions, and all amendments, as filed with the Department.
- 5.2 A railway company shall file with the Department a full description of the training program, criteria and all amendments used for qualifying those employees performing brake tests in accordance with these Rules.
- 5.3 A railway company shall maintain a record of all qualified persons. This record shall be made available to a railway safety inspector upon request.

## **6. PRE-DEPARTURE REQUIREMENT FOR LOCOMOTIVES**

- 6.1 When taking charge of a locomotive(s), except when changing off with another crew, the locomotive engineer or qualified person shall determine that all brakes are functional.
- 6.2 When the brake test is done by other than the locomotive engineer, the results of the test shall be made available to the locomotive engineer and be retained on record for ninety-two (92) days.

## **7. OPERATING REQUIREMENTS**

- 7.1 A freight train shall operate with no less than eighty-five (85) percent of the train brakes operative, except as provided in Subsection 8.4 of these Rules.
- 7.2 A freight train having received a No.1 or 1A brake test may only depart a terminal if:
  - a) the train line brake pipe pressure on the tail end of the train is within fifteen (15) psi (one hundred (100) kpa) of the locomotive brake pipe pressure, and,
  - b) air flow to the brake pipe does not exceed sixty (60) cubic feet (one point seven (1.7) cubic metres) per minute, as indicated by the flow indicator or brake pipe leakage does not exceed five (5) psi (thirty-five (35) kpa) in sixty (60) seconds.
- 7.3 A railway company shall instruct its operating employees of the territory in which pressure-retaining valves shall be used.
- 7.4 A passenger train shall be operated with no less than eight-five (85) percent of the train brakes operative, including the locomotive(s), unless a reduction in train speed is made, as determined by the locomotive engineer, in accordance with company procedures/work instructions, and all amendments, as filed with the Department.
- 7.5 A running brake test of passenger train brakes shall be performed after leaving any location where the crew is changed in accordance with company procedures/work instructions.
- 7.6 When a train experiences a brake system or a safety control failure or malfunction en route which cannot be readily corrected, the conductor, or in his/her absence, the locomotive engineer, shall report the location, date, time, description of the failure or malfunction and the appropriate action taken by the engineer, in accordance with company procedures/work instructions.
- 7.7 When the leading locomotive ceases to control a train en route, a continuity test shall be made from the controlling locomotive, and as soon as possible, the controlling locomotive will be placed in the lead position.

- 7.8 When the safety control on the controlling locomotive becomes inoperative while a train is en route, it may be cut out, and as soon as possible, corrective action shall be taken to either repair the safety control or change the locomotive.
- 7.9 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 bad order 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) there are no more than two (2) consecutive inoperative control valves;
  - c) except as provided in Subsections 8.6, 8.8 and 8.9 of these Rules, there shall be a minimum of three (3) cars with operative brakes at the rear of a freight train;
    - i. on cars of articulated or permanently coupled multi-platform design, at least fifty (50) per cent of the control valves must be operational for car to be considered as having operational brakes
  - d) passenger trains shall have the brakes operational on at least one (1) truck on the last car in the train and no less than eight-five (85) percent of the brakes shall be operative; and
  - e) passenger trains having cars with bolted couplers design may depart from other than a safety inspection location, with the brakes cut out on the last car, when:
    - i. appropriate action is taken by the locomotive engineer, in accordance with company procedures/work instructions, and
    - ii. the defective car is repaired, set off, or relocated in the consist of the train at the first safety inspection location in the direction of travel, and
    - iii. the Department is advised of each occurrence.
- 8.2 A railway company shall control and protect the movement of a car with inoperative brakes with a train brake status system in accordance with company procedures/work instructions. This may include the use of a bad order card.
- 8.3 The conductor, or in his or 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 is updated in accordance with company procedures/work instructions.
- 8.4 Cars or locomotives with inoperative brakes due to damage may be moved in a train when authorized by a person in charge. In accordance with company procedures/work instructions, the person in charge will ensure that appropriate measures have been taken to move such equipment safely and identify the destination in the direction of travel where the equipment will be repaired.



- 8.5 On trains of eighteen (18) cars or less, when it is not possible to comply with Subsection 11.6 of these Rules, a train may proceed with equipment that has inoperative brakes provided that:
- a) the conductor and locomotive engineer are advised of the placement of such equipment in the train;
  - b) the appropriate action, such as the reduction of train speed, is taken so as to ensure safe operation, in accordance with company procedures/work instructions;
  - c) the requirements of Subsection 7.1 of these Rules 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 with inoperative brakes may be moved at the rear of a freight train in test mode provided it is coupled and secured to a car with operative brakes.
- 8.9 In accordance with company procedures/work instructions, the person in charge may move cars or locomotives with inoperative brakes, due to damage en route, at the rear of the train when no other option exists.

## **9. CORRECTIVE ACTION REPORTING**

- 9.1 A railway company shall reply in writing or by acceptable electronic means, within fourteen (14) days, to the Department's regional office concerned, on the corrective action taken to correct a non-compliance(s) reported by a railway safety inspector. On defective equipment, the reply, from a railway officer, shall also include the equipment initials and number and the date and location of the corrective action taken.

## **PART II – BRAKE TEST REQUIREMENTS**

### **10. GENERAL**

- 10.1 A train shall not depart from any location until a successful brake test(s), as outlined in this Part and in railway company procedures/work instructions has been performed and all appropriate documentation has been completed.
- 10.2 No.1 and No.1A brake tests shall be performed on every train as specified in these Rules and company procedures/work instructions by:
- a) the brake pipe leakage method; or
  - b) the air flow method.
- 10.3 The conductor, or in his or her absence, the locomotive engineer, shall be responsible for determining that the prescribed test(s) has been completed prior to departure. When a pull-by inspection for the brake release is performed on freight trains, the conductor or locomotive engineer shall be provided with the results of the release and in turn, will update the train brake status system.
- 10.4 A vehicle assisted No.1 brake test may be performed by a certified car inspector(s) in accordance with company procedures/work instructions, and shall be made available to a safety inspector upon request.

### **11. NO. 1 BRAKE TEST**

- 11.1 A No.1 brake test shall be performed by a certified car inspector(s) at safety inspection locations on:
- a) trains that are made up at that location;
  - b) cars added to a train at that location;
  - c) cars that are interchanged.
  - d) If a train is made up at other than a safety inspection location, a No. 1 brake test will be performed at the safety inspection location designated for that train by the railway company in the direction of travel.
- 11.2 Exceptions: A No.1 brake test is not required on:
- a) trains operating over main tracks, between yards, up to a maximum of a thirty (30) mile (fifty (50) kilometre) radius. Such trains shall be engaged exclusively in the

- setting off or lifting of equipment at industry(s), and/or the transfer of equipment between yards, and they shall be filed with the Department.
- b) a block swap of cars that have been off air for no more than 24 hours or 48 hours after notifying the department.
- 11.3 A No.1 brake test shall verify:
- a) the integrity and continuity of the brake pipe;
  - b) that the condition of the brake rigging on each car in the train meets the minimum requirement specified in Sections 20, 21 and 22 of these Rules;
  - c) that the application and release of the brakes on each car is performed by visible verification of the piston or brake indicator device displacement; and
  - d) that piston travel on each car is within the specified limits.
- 11.4 A pull-by inspection by a certified car inspector may be performed to verify the release of the train brakes.
- 11.5 Certified car inspectors shall report, in accordance with company procedures/work instructions, the results of all brake tests performed. Any brake system defect(s) discovered during the brake test and not repaired prior to departure shall be documented as bad order and reported to the conductor, or in his or her absence, the locomotive engineer. The conductor/engineer shall update the train brake status system with the identified defect(s). The results of the tests performed by certified car inspectors shall be retained for ninety-two (92) days.
- 11.6 After completing a No.1 brake test, a train may depart from a safety inspection location with ninety-five (95) percent of the train brakes operative, once every reasonable effort has been made to maintain one hundred (100) percent operative brakes. This requirement does not apply to cars referred to in Subsection 8.4 of these Rules.
- 11.7 A No. 1 brake test is not required at an interchange point and/or when entering Canada provided the locomotive engineer has access to records that indicate that a No.1 brake test, as per these Rules, or an initial terminal brake test by mechanical personnel in the United States, was performed.

## **12. NO. 1A BRAKE TEST**

- 12.1 No.1A brake test shall be performed by a qualified person(s) on:
- a) trains made up at other than a safety inspection locations;
  - b) cars lifted en route; and/or
  - c) trains operating over main tracks, between yards, up to a maximum of a thirty (30) mile (fifty (50) kilometre) radius. Such trains shall be engaged exclusively in the setting off or lifting of equipment at industry(s), and/or the transfer of equipment

between yards, and shall be filed with the Department.

- 12.2 A No.1A brake test is not required on blocks of cars lifted en-route that have:
- a) previously received a No.1 brake test for which the brake status information is received; and/or
  - b) previously received a No.1A brake test at that location within twenty-four (24) hours of the lift for which the brake status information is received.
- 12.3 A No.1A brake test shall be performed by a walking inspection of stationary equipment. A pull-by inspection by a qualified person may be performed to verify the release of the train brakes.
- 12.4 A No.1A brake test shall verify:
- a) the integrity and continuity of the brake pipe; and
  - b) the application and release of each car brake.
- 12.5 A qualified person(s) shall record and report the test results, and any brake system defect(s) discovered during the brake test, to the train brake status system, in accordance with company procedures/work instruction.
- 12.6 The conductor, or in his or her absence, the locomotive engineer, shall be responsible for determining that the prescribed test(s) has been completed prior to departure.
- 12.7 The results of the No.1A brake tests performed:
- a) by the train crew while enroute shall be recorded and retained until the train reaches it's final destination.
  - b) by other than the lifting train crew shall be retained for a period of thirty (30) days.

### **13. CONTINUITY TEST**

- 13.1 A continuity test shall be performed by a qualified person(s) when:
- a) a solid block(s) of coupled cars which have received a No.1 or No.1A brake test are added to a train;
  - b) the controlling locomotive has been attached to a train having received a No.1 or No.1A brake test;
  - c) the locomotive consist has been exchanged or altered;
  - d) the locomotive engineer has been changed;
  - e) the brake pipe has been re-coupled after being uncoupled; and/or
  - f) the locomotive is re-coupled to the train after setting off cars.

13.2 The continuity test shall verify the capability to transmit a signal between the leading locomotive and to the rear of the last piece of equipment on the train.

#### **14. TRAIN INFORMATION BRAKING SYSTEM (TIBS) TEST**

14.1 A TIBS test shall verify that an emergency brake application, initiated from the controlling locomotive or dedicated IDU through the TIBS system, will cause an emergency brake application on the last piece of equipment on the train.

14.2 When the sense and braking component of the TIBS system is first added to a train or when it is suspected that the sense braking component has been stricken or damaged while en route the operation of TIBS will be verified by a qualified person(s) in accordance with railway company procedures/work instructions.

14.3 In the event of a TIBS failure, where the standard locomotive gauges and air flow indicator display no loss of air pressure, the train may proceed at a speed not to exceed twenty-five (25) mph (forty (40) km/h), until the TIBS resumes normal operation.

#### **15. TRANSFER BRAKE TEST**

15.1 Prior to departure, the locomotive engineer, or the portable locomotive remote control device operator must verify that there is sufficient braking effort to control the transfer. Except where block signals provide protection, transfers must have air applied throughout the entire equipment consist and the last three cars must be verified to have operative brakes.

15.2 Transfers carrying dangerous goods must have air applied throughout the consist.

#### **16. PUSH-PULL OPERATION**

16.1 On a train operated in a push-pull mode, a continuity test must be made from the controlling cab car or locomotive after changing ends.

#### **17. PORTABLE LOCOMOTIVE REMOTE CONTROL DEVICE TILT TEST**

17.1 A portable locomotive remote control device tilt test shall be performed once every twenty-four (24) hours, and when it is not a direct operator to operator hand

off. The test shall be performed in accordance with company procedures/work instructions, and shall verify:

- a) application and release of the train brakes;
- b) that an emergency brake application is initiated as per its design;
- c) when tilted, the device will apply the brakes and nullify the transmission of power to the locomotive traction motors.

17.2 A modified tilt test may only be performed on a direct operator to operator hand off, in accordance with company procedures/work instructions.

## **18. TRAINS USING BACK-UP HOSE OR VALVE**

18.1 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.

## **19. SNOW PLOW TRAIN BRAKE TEST**

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

## **PART III – EQUIPMENT REQUIREMENTS**

### **20. MAINTENANCE**

- 20.1 All brake equipment shall be maintained in a safe and serviceable condition.
- a) freight car brakes shall be maintained in accordance with the current AAR requirements and railway company procedures/work instructions;
  - b) passenger car brakes shall be maintained in accordance with the current American Public Transit Authority (APTA) requirements and/or railway company procedures/work instructions;
  - c) locomotive brakes shall be maintained as a minimum in accordance with AAR requirements, manufacturers recommendations or as otherwise filed with and approved by the Department and railway company procedures/work instructions.
- 20.2 Locomotives equipped with electronic air brake systems shall be equipped with air dryers and maintained as per design and company procedures/work instructions.
- 20.3 On locomotives 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 in a format in accordance with railway company procedures/work instructions.
- 20.4 Train brake test devices shall be cleaned, repaired and tested every ninety (90) days, to maintain safe and satisfactory operation, in accordance with company procedures/work instructions.
- 20.5 A locomotive that is out service for 30 or more consecutive days may use the time to extend the Clean Oil Test & Stencil maintenance date. An out of service record shall be retained as per company procedures/work instructions. A locomotive can have one or more periods of 30 or more consecutive out of service days. Each period must be recorded as above. Once COT&S air-brake changeout is completed, all credit days revert to zero days.

### **21. BRAKE CYLINDER PISTON TRAVEL**

- 21.1 A car with a body-mounted brake cylinder has piston travel out of adjustment when:
- a) on a freight car, the piston travel is less than six (6) inches (one hundred fifty (150) mm) or more than nine (9) inches (two hundred thirty (230) mm);

- b) on a passenger car, the piston travel is less than seven (7) inches (one hundred eighty (180) mm) or more than nine (9) inches (two hundred thirty (230) mm).
- 21.2 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.
- a) on a freight car, piston travel shall not exceed five (5) inches (one hundred twenty-five (125) mm);
  - b) on a passenger car, piston travel shall not exceed six (6) inches (one hundred fifty (150) mm).
- 21.3 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.
- 21.4 A passenger car with a special type of brake equipment, not covered by the above, shall have the brakes maintained in accordance with company procedures/work instructions.
- 21.5 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 (2) inches (fifty (50) mm) of the limit. For example, should the brake cylinder permit an eight (8) inch (two hundred (200) mm) travel, the maximum piston travel shall not exceed six (6) inches (one hundred fifty (150) mm).

## **22. LOCOMOTIVE FEED VALVES AND PRESSURE SETTINGS**

- 22.1 Air pressure feed valves shall be adjusted to the following pressures in accordance with company procedures/work instructions:
- a) the minimum brake pipe pressure with the automatic brake valve in release position shall be ninety (90) psi (six hundred twenty (620) kpa) for passenger service and eighty (80) psi (five hundred fifty (550) kpa) for freight and remote control locomotive operation;
  - b) the minimum differential between the brake pipe and main reservoir air pressures with the brake valve handle in release position shall be fifteen (15) psi (one hundred (100) kpa);
  - c) the independent brake cylinder pressure shall be the full application pressure, as posted in cab.



## PART IV – FILING REQUIREMENTS

### **23. FILING REQUIREMENTS WITH THE DEPARTMENT**

- 23.1 A railway company shall file railway schedules with the Department. Any changes to the railway schedules shall be filed by the railway company with the Department within thirty (30) days of implementation.
- 23.2 A railway company shall file with the Department, procedures/work instructions, and all amendments, for:
- (i) No.1 brake test,
  - (ii) Vehicle assisted No. 1 brake tests,
  - (iii) Brake tests of trains having a supplementary source of air supply at a location other than the head end locomotives,
  - (iv) Train brake testing device calibration,
  - (v) No.1A brake test, including the audit protocol used by the railway to ensure compliance,
  - (vi) Continuity test,
  - (vii) Running brake test,
  - (viii) Train information braking system tests,
  - (ix) Single car test,
  - (x) Locomotive functional brake test,
  - (xi) Calibration of locomotive brake pipe flow indicator/metre,
  - (xii) Portable locomotive control device tilt test and modified tilt test,
  - (xiii) Reporting of brake system failures,
  - (xiv) Control and protection of a movement of cars and locomotives with damaged or inoperative brakes due to damage,
  - (xv) Control and protection of a movement of cars or locomotives with inoperative brakes at the rear of the train, due to damage en route, when no other option exists,
  - (xvi) Movement of 18 cars or less with less than ninety-five (95) percent of operative brakes,
  - (xvii) Scale and test car movements,
  - (xviii) Repairs to air brake components,
  - (xix) Updating of the train brake status system,
  - (xx) Air pressure feed valves adjustment, and
  - (xxi) A brake system or a safety control failure or malfunction en route which cannot be readily corrected.
  - (xxii) Procedure to follow when a brake system component found to have been tampered with en route.
  - (xxiii) Locomotive out of service record and return to service tests.

- 23.3 A railway company may operate trains with advanced technological/operational improvements provided that the testing and operating procedures have been filed with the Department, sixty (60) days prior to testing or placing in service, and the results of the railways risk assessment is provided with the submission.
- 23.4 Museum train operations shall be filed with the Department thirty (30) days prior to its being placed in service.