SECTION 6
TRAIN INSPECTION

🕮 *Train inspection*

Trains and *vehicles* must be inspected in accordance with Department of Transport (DoT) approved *Operator Specific Procedures* (OSP's) before operating on the Track Access Provider network to ensure that they are safe to travel and are fit for purpose.

Vehicles covered by a DoT approved programmed preventative maintenance (PPM) are permitted to operate for an approved extended period of time between full train inspections.

Locomotive hauled trains

There are two levels of train inspection for locomotive hauled trains.

One inspection, the ***full train inspection***, must be performed by a *qualified worker*. This inspection includes a **full mechanical inspection**, brake pipe leakage test, air brake inspection and test, brake holding test and brake pipe continuity test.

The other train inspection, the ***general train inspection***, must be performed by the train crew. This train inspection includes a **general mechanical inspection**, brake pipe leakage test, air brake inspection and test, brake holding test and brake pipe continuity test.

Freight trains that are to descend grades of 1 in 33 or greater, and are not fitted with fixed exhaust chokes on 80 per cent of the train mass, are required to undergo a HP grade inspection.

A ***partial train inspection*** must be carried out after the train consist has been altered in any way, such as changing or attaching *locomotives,* attaching or detaching vehicles, amalgamating trains, attaching assisting locomotives or running locomotives around to the other end of a train.

There must be a stable air supply, locomotive or ground plant, available for testing to meet the pressure requirements of the *air brake* test.

The last three vehicles on a train must have operative air brake, *handbrakes* and have passed the brake holding test.

Multiple unit trains

There are various levels of inspections for *multiple unit trains*. general, pantograph, reservoir and brake inspections. Multiple unit trains also undergo daily preparation by train crews.

🕮 *Full mechanical inspection*

As a minimum, a full mechanical inspection includes a visual inspection of each vehicle in respect to the adjustment, condition and/or security of the following items (where fitted):

Brake equipment:

- Relevant *coupling hoses* are correctly coupled and appropriate *coupling cocks* open.
- Brake block/disc pad thickness.
- Brake blocks are correctly aligned, that is, not permanently overhanging the edge of the wheel.
- Brake rigging (levers, rods, pins, cotters, bogie safety loops, etc.) is secure.
- All load compensating and grade control equipment are correctly set.
- Air pipes, pipe fittings and securing clips.
- Reservoirs, variable volume device and safety valves
- Slack adjusters and fittings
- Brake cylinders
- Grade control valve, securing brackets and bolts
- Release valve and operating chain or wire

🕮 *Full mechanical inspection (continued)*

Vehicle equipment:

- Automatic couplers are secured and the difference in height of connected coupler knuckles does not exceed half the depth of the knuckle.
- Knuckle pins, knuckles, drawgear carrier plates, murray keys, yolks, draftgear, uncoupling rods and associated brackets
- Doors, container securement, trailer hitches and wheel chocks.
- Securing of loads and loading within gauge
- Centre sills, side sills, end sills and stanchions
- Side bearers and side bearer clearances
- Steps, handrails and ladders
- Doors and twistlocks
- Gangway beams and diaphragms
- Correct centre casting engagement

Bogie and wheel equipment:

- Wheel profiles and tread condition.
- Handbrake assemblies and linkages.
- Bogie springs and damping devices.
- Centre castings
- Bogie springs, ride control equipment (ie friction wedges and other damping devices) and specialized bogie equipment
- Roller bearing end caps, seals, backing rings, axle box plugs, adapters and horn stays (con straps)
- Loose axle box liners or loose horn cheek wear liners
- Trip assembly
- Air ride suspension

🕮 *General mechanical inspection*

As a minimum a general mechanical inspection includes a visual inspection of each vehicle in respect to the adjustment, condition and/or security of the following items (where fitted):

Brake equipment:

- Relevant coupling hoses are correctly coupled and appropriate coupling cocks open.
- Brake block/disc pad thickness.
- Brake blocks are correctly aligned, that is, not permanently overhanging the edge of the wheel.
- Brake rigging (levers, rods, pins, cotters, bogie safety hoops, etc.) is secure.
- All load compensating and grade control equipment are correctly set.

Vehicle equipment:

- Automatic couplers are secured and the difference in height of connected coupler knuckles does not exceed half the depth of the knuckle.
- Doors, container securement , trailer hitches and wheel chocks.
- Securing of loads and loading within gauge
- Centre casting engagement

Bogie and wheel equipment:

- Wheel profiles and tread condition.
- Side bearer clearance.
- Handbrake assemblies and linkages.
- Axle box plugs, bearing end caps, adaptors.
- Bogie springs and damping devices.

🕮 *Air brake inspection and tests*

The following items must be checked with the brakes fully applied. Note for freight trains the ***brake pipe must be fully exhausted***: XPT and multiple unit trains are tested with a **full service** brake application.

- That the brakes on vehicles (within the limits for allowable cut-outs) are applied, that is, brake cylinder pistons are extended and brake blocks are against the wheels.
- The brake block thickness is not less than 10 mm at any point and is sufficient till the next scheduled general train inspection.
- All load compensating and grade control equipment (where fitted) are correctly set.

The following items must be checked with the ***brake pipe fully charged***:

- That the brakes are released on each vehicle.
- Handbrakes are released.
- Repair, if possible, any air leaks.

🕮 *When is a train inspection required?*

All trains shall be inspected for each trip. However, some trains/vehicles are under an approved preventative maintenance programme (PPM) and may be allowed to operate for a number of trips without being inspected each trip.

Freight trains

Notes:

- unless a train is under programmed preventative maintenance cycle two consecutive **general train inspections** are not permitted.
- Some trains approved by the DoT are permitted to operate for a round trip between general train inspections.
- Some trains approved by the DoT are permitted to operate for up to 7 days between general train inspections.

A HP grade inspection is specified in the appropriate area Section pages of the TOC manual, covering trains with grade control valves travelling on specific grades. A HP grade inspection must be carried out by a qualified worker and may be performed during a ***full train inspection***. In this test, the grade control valves are tested to ensure that brake cylinder release is retarded when in the 'IP' position.

🕮 *Brake pipe leakage test*

The brake pipe leakage test determines whether there are excessive air leaks in the train which may interfere with the operation of the air brake system and confirms that only one brake valve controls the train brake.

With a **full service** brake pipe reduction and the brake pipe isolated, the maximum allowable leakage in the brake pipe is 35 kPa per minute.

🕮 *Brake pipe continuity test*

The brake pipe continuity test must be carried out on a train to prove that the brake pipe air pressure is continuous throughout the train, the driver has control of the brakes on the train and proves that only one brake valve isolating cock is open.

Locomotive hauled trains

The **full continuity test** is the standard test. This is usually conducted at the rear of the train and is required after a brake holding test has been carried out.

Where a train is fitted with an *end of train marker* (EOTM) which has the capacity to indicate, in the locomotive cab, the brake pipe pressure at the rear of the train, this device may be used to conduct the continuity test.

Where the brake pipe on a locomotive hauled train has been interfered with, a **modified continuity test** must be carried to ensure that the brakes apply and release on the three vehicles behind the position where the brake pipe has been interfered with. If one or more of the three vehicles behind the position where the brake pipe was interfered with has inoperative air brakes, then the first three vehicles with operative air brake beyond the point of interference shall be tested.

🕮 *Brake pipe continuity test (continued)*

A **light locomotive continuity test** is required for light multiple locomotive consists to ensure that brake pipe is continuous through the consist and that all brake cylinders are functioning correctly.

Multiple unit trains

A continuity test is carried out after a train has been prepared, after amalgamation or division of trains, and if the *brake pipe continuity* has been affected.

🕮 *Brake holding test*

The brake holding test only applies to locomotive hauled trains.

The brake holding (retention) test proves that the brakes on the rear three vehicles, and any other vehicles tested, will remain applied for a long enough time period, in the event of a break-away, to allow the train crew to reach these vehicles and to apply the handbrakes, in order to secure the train. The brake holding test must be conducted with the brake pipe fully exhausted.

The brake holding time is determined by the length of the train. If it is known that additional vehicles will be added to the train, an extended brake holding time takes account of the increased train length with these additional vehicles.

The brake holding test must be conducted, as a minimum, on the last three vehicles on the train. The brake holding test may also be conducted on the front three vehicles. It is permissible to conduct a brake holding test on more than three vehicles where it is known that some of the vehicles will be detached enroute.

At all times, a valid brake holding test must apply to the last three vehicles of the train for the entire journey.

For locomotive hauled trains with less than three vehicles, all vehicles must be tested.

If a rake of 3 or more vehicles is attached to a freight train enroute, and an extended brake holding test was not carried out, a further brake holding test is required for the longer train length.

The minimum standard brake holding time is ten minutes plus three minutes for every 100 metres (or part thereof) of train length.

Length of train including locomotives (metres)	**Minimum brake holding time (minutes)**
Up to 100	13
101to 200	16
201 to 300	19
301 to 400	22
401 to 500	25
501 to 600	28
601 to 700	31
701 to 800	34
801 to 900	37
901 to 1000	40
1001 to 1100	43
1101 to 1200	46
1201 to 1300	49
1301 to 1400	52
1401 to 1500	55
1501 to 1600	58
1601 to 1700	61
1701 to 1800	64
1801 to 1900	67
1901 to 2000	70
Over 2000	70 plus 3 minutes for every additional 100 metres

🕮 *Brake holding test (continued)*

If articulated vehicles or permanently coupled vehicles are marshalled at the rear of a freight train, the brake holding test is carried out by observing that all brake cylinders controlled by the rear three control valves are extended.

A brake holding test is not required for vehicles fitted with spring applied parking brakes, such as Trailerail vehicles and some track maintenance vehicles. These brakes are applied once air pressure is lost and will remain applied indefinitely due to the spring force on the brake cylinder piston.
Where a locomotive is unmanned and is marshalled in the last three vehicles on a train, then it must be tested for brake holding.
Where driver only trains are employed, ten minutes shall be added to the minimum standard brake holding times.

If one of the last three vehicles on the train fails the brake holding test, the defective vehicle must be remarshalled and the new last three vehicles brake holding tested.

Up to three additional locomotives may be added to a train without the need for an additional brake holding test.

🕮 *Changing or attaching locomotives*

When locomotives are detached, the time of detachment must be noted on the train documentation delivered to the outgoing driver, lodged with an operations employee or placed in the appropriate receptacle provided at certain locations.

After attaching the locomotives, the crew must check the train inspection certificate to ensure that the last three vehicles (and if appropriate, the front three vehicles) are the same as those listed on the train documentation. The train crew must ascertain from operations staff the time of detachment and confirmation that the train has not been altered since detachment:

If less than 2 hours has elapsed since the locomotives were detached ⇨ **OR**	**Action** • a brake pipe leakage test, • and a modified continuity test must be carried out.
If more than 2 hours but less than 24 hours has elapsed since the locomotives were detached ⇨ **OR**	**Action** • a visual inspection of each vehicle, • a brake pipe leakage test, • and a full continuity test must be carried out.
If more than 24 hours has elapsed since the locomotives were detached ⇨	**Action** • a **full train inspection** must be carried out.

When attaching locomotives to a pre-inspected train and the train consist has not changed from that indicated in the train documentation:

and the time elapsed since the inspection is **less than 24 hours** ⇨ **OR**	**Action** • a visual inspection, • a brake pipe leakage test, • and a full continuity test must be carried out.
If the time elapsed since the train was inspected is **24 hours or more** ⇨	**Action** • a full train inspection must be carried out.

🕮 *Attaching pre inspected vehicles*

A rake of pre-inspected vehicles may be attached anywhere within a train consist enroute at an intermediate location (except as provided by regulations for the transport of dangerous goods).

In this case, if the consist of the pre-inspected vehicles has not changed from that indicated in the train documentation **and less than 24 hours** has elapsed since the vehicles were inspected **and:**

3 or less vehicles are attached in front of the last three vehicles or more than 3 vehicles are attached in front of the last three vehicles **and** an extended brake holding test has been carried out then: **OR**	⇨	**Action** • a visual inspection of each vehicle being attached, • a brake pipe leakage test, • and a modified continuity test must be carried out.
more than 3 vehicles are attached in front of the last three vehicles and an extended brake holding test has NOT been carried out **or** If any number of vehicles are attached to the train rear of the last three vehicles, then:	⇨	**Action** • a visual inspection of each vehicle being attached, • a brake pipe leakage test, • a brake holding test,, • and a full continuity test must be carried out.

If the consist of the attached vehicles has changed from that indicated in the documentation for the attached vehicles, or the time elapsed since the inspection of the pre-inspected vehicles is 24 hours or more, then a ***full or general train inspection*** must be carried out on the attached vehicles.

🕮 *Attaching uninspected vehicles*

One or more rakes of uninspected vehicles may be attached anywhere within a train consist enroute at intermediate locations (except as provided by the regulations for the transport of dangerous goods).

In this case when the vehicles are attached, the uninspected vehicles must be given a ***general mechanical inspection***.

3 or less vehicles are attached in front of the last three vehicles then: **OR**	⇨	**Action** • a brake pipe leakage test, • and a modified continuity test must be carried out.
more than 3 vehicles are attached in front of the last three vehicles and an extended brake holding test has been carried out then: **OR**	⇨	**Action** • a brake pipe leakage test, • and a modified continuity test must be carried out.
If more than 3 vehicles are attached in front of the last three vehicles and an extended brake holding test has NOT been carried out then: **OR**	⇨	**Action** • a brake pipe leakage test, • a brake holding test, • and a full continuity test must be carried out.
If any number of vehicles are attached to the train in rear of the last three vehicles or within the last three vehicles then	⇨	**Action** • a brake pipe leakage test, • a brake holding test, • and a full continuity test must be carried out.

🕮 *Attaching or detaching assisting locomotives*

When attaching assisting locomotives to the front of the train then **OR**	**Action** • a brake pipe leakage test, • and a modified continuity test must be carried out.
When detaching assisting locomotives from the train **OR**	**Action** • restore the brake pipe pressure, • and apply and release the brakes at least twice to overcome any overcharge. No further inspection is required.
When attaching assisting (bank) locomotives to the rear of the train and the brake pipe is connected then: **OR**	**Action** • a brake pipe leakage test, • and a full continuity test must be carried out.
When employing assisting (bank) locomotives at the rear of the train and there is no connection to the brake pipe	**Action** No further inspection is required.

🕮 *Detaching vehicles*

Vehicles may be detached from anywhere within a freight train consist enroute at intermediate locations provided that the altered train does not contravene the requirements for the transport of dangerous goods.

The vehicles that become the last three vehicles of the train consist must have been tested for brake holding.

However, if any of the last three vehicles are detached, and additional vehicles have not had a brake holding test, then a holding test must be carried out on the vehicles which are now the last vehicles on the train. A full continuity test is then conducted in place of the modified continuity test.

After detaching vehicles from a locomotive hauled freight train then: **OR**	**Action** • a brake pipe leakage test, • and a modified continuity test must be carried out.
After detaching vehicles from a locomotive hauled passenger train then:	**Action** • a brake pipe leakage test, and a full continuity test must be carried out..

🕮 *Locomotive run around movements*

When locomotives are involved in a *run around* movement and reattached and a brake holding test has been previously carried out on the three vehicles which become the last three vehicles on the train, a modified continuity test must carried out.

If the brake holding test has not previously been carried out on the three vehicles which become the last three vehicles on the train, a brake holding test and a modified continuity test must be carried out.

🕮 *Programmed preventative maintenance*

Programmed preventative maintenance (PPM) is regular vehicle or train maintenance based on a fixed time or distance travelled cycle, approved by the DoT, to ensure that the vehicle will remain fit for purpose for at least the duration of the PPM cycle.

To claim a PPM status for any vehicle type, or group of vehicles, an operator must demonstrate that there are written maintenance procedures and a maintenance history recording and tracking system in place. This is to ensure that the nominated vehicles receive their due maintenance within the nominated maintenance cycle.

Vehicles that are scheduled for PPM are permitted to operate with consecutive general train inspections. However, a ***full train inspection*** must be scheduled for a period of time not exceeding 14 days.

Approval to extend the nominated PPM maintenance periods, including full train inspection periods, for particular train operations may be given by the DoT and the RIC based on the submission of satisfactory evidence to support the variation. .

When a PPM vehicle/train exceeds the PPM period, the train may complete its loading cycle and must return to its maintenance location to retain its PPM status. It is, however, permissible for a vehicle/train which is outside PPM to continue operation as a non-PPM vehicle/train with the appropriate inspections.

Where vehicles are added to a PPM train, they must be of the same or better maintenance standard or the train must operate as a non-PPM train until the PPM standard is restored.

Unit train operation

Unit train operation is a PPM operation where vehicles within the train consist remain unchanged during the PPM period. It is permissible to replace vehicles in the unit with pre-inspected spare vehicles if required.

All vehicles on a unit train must receive a ***full train inspection*** and unit train maintenance at the Department of Transport approved unit train maintenance period, and a ***full train inspection*** within the RIC approved intermediate period. Unit trains do not require general train inspections within the full train inspection period.

After unloading, but before reloading, unit trains must be inspected to ensure that the train has no defects which may affect the safe operation of the train and that the door of all vehicles are closed and secured.

Where applicable, immediately after loading and unloading, the train must be inspected to ensure that manual empty/load" valves and grade control valves are set correctly.

Attaching non-unit vehicles to a unit train. It is permissible to attach non-unit vehicles to a unit train. The non-unit vehicles must have a full or general train inspection. These vehicles must be marshalled at the front or rear of an empty unit train or on the rear of a loaded unit train.