

SECTION 8
**DISABLED TRAINS AND
DEFECTIVE VEHICLES**

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Document control

Revision	Date of Approval	Summary of change
1.0	18/10/11	For publication
2.0	9/09/15	<ul style="list-style-type: none">• Document renamed to include defective vehicles• Section added covering the moving or removal of defective vehicles• Table added covering XPT brake cut-outs and appropriate operating restrictions
3.0	2/09/20	Updated as detailed below

Summary of changes from previous version

Section	Summary of change
All	Updated formatting to match other revised TOC Manual Sections

1. GENERAL OPERATING CONDITIONS

1.1. The following Country Regional Network Rules may apply to any Defective Vehicle or Disabled Train. The Network Rules requirements are to be adhered to in addition to the requirements of this document:

CNTR 410 – Defective equipment

CNTR 412 – Defective running gear

CNTR 414 – Defective vehicles

CNTR 416 – Disabled rail traffic

1.2. A disabled train is any train that cannot safely & reliably complete its journey under its own power.

1.3. When a vehicle on a train, including a locomotive, becomes defective, the vehicle must be repaired, made safe to travel or removed from the train.

2. MOVING OR REMOVING A DEFECTIVE VEHICLE

2.1. A vehicle is considered defective if it cannot function correctly or as intended. There are a number of vehicle defects which require specific attention in order to remove the vehicle from the network or to work the vehicle out of service. The following vehicle defects present a risk to the vehicle owner/operator and to the infrastructure owner/manager.

2.1.1. **Defective Wheels**

Refer to the clauses below covering wheel defect level and the appropriate course of action.

2.1.2. **Defective Brakes**

Refer to the clauses below covering brake defects and the appropriate course of action.

2.1.3. **Defective Drawgear**

Refer to the clause below covering coupler/drawgear defects and the appropriate course of action.

2.2. The following defects require an engineering assessment before there is any attempt to move or operate the defective vehicle on the Country Regional Network. **The vehicle shall not operate on the network unless covered by an appropriate TOC Waiver authorising the movement.**

2.2.1. **Defective Structure**

A vehicle with a structural defect such as a cracked/broken centre sill or body bolster which has the potential to compromise its safe operation, shall not be moved on rail until the defect is assessed by a qualified structural/mechanical engineer.

2.2.2. **Defective Bogie**

A bogie with a structural defect such as a cracked/broken frame or bolster, displaced or missing side bearers, which has the potential to compromise its safe operation, shall not be moved on rail until the defect is assessed by a qualified structural/mechanical engineer.

2.2.3. **Defective Suspension**

A vehicle with a defective suspension such as a broken/missing or displaced spring, which has the potential to compromise its safe operation, shall not be moved on rail until the defect is assessed by a qualified rolling stock inspector or engineer.

2.2.4. **Defective Air Spring**

For deflated air springs refer to the clause below covering this defect and the appropriate course of action.

3. REMOVING A DISABLED TRAIN

- 3.1. Unless it is an emergency, before an assisting locomotive or train is used to rescue a disabled train, the Operator's representative of the assisting and disabled trains must be consulted to determine if there are any specific operating instructions and/or restrictions which must be adhered to, to safely affect the rescue of the train. The following instructions/restrictions must be used as a guide in rescuing some specific train types.
- 3.2. Any disabled train which must be assisted by another train or locomotive(s) to clear the section, the Operator's representative must ensure it is safe to travel before being assisted from a section. If the disabled train is amalgamated with a similar type of train or locomotive/s, normal operating procedures will apply.
- 3.3. Most diesel multiple unit trains are fitted with combined multi-function couplers that are incompatible with conventional full-size knuckle type automatic couplers. Some vehicles are equipped with emergency couplers to enable them to be coupled to a locomotive or train.
- 3.4. The Operator's representatives must be consulted regarding coupling of different types of trains.

3.5. Disabled self-propelled passenger trains

- 3.5.1. The Operator's representatives must be consulted before assisting a disabled diesel multiple unit train or vehicle.
- 3.5.2. Whether assisting from the front or rear of a disabled train, the air brake system, where compatible, must be connected and working throughout the entire train. The driver at the front of the complete train shall have full control of the automatic air brake and be in radio contact with the driver of the assisted or assisting train or locomotive, whichever the case may be.

3.6. Disabled locomotive hauled freight and passenger trains

- 3.6.1. If the air brake is compatible, it must be connected and working throughout the entire train. The driver at the front of the train should have full control of the automatic air brake and be in radio contact with the driver of the propelling train or locomotive.
- 3.6.2. If a train has been divided or had vehicles detached or remarshalled, a brake pipe continuity test must be carried out.
- 3.6.3. If one or more of the last three vehicles have been changed then a brake holding test must also be carried out. On freight trains, the end of train marker (EOTM) must be relocated to the last vehicle.
- 3.6.4. When coupling to vehicles fitted with buffers, gangway beams, diaphragms, etc., care must be taken to ensure that there is adequate clearance between these items and brake coupling cocks on adjacent vehicles.

**WARNING**

4. ASSISTING WITH A PASSENGER TRAIN

- 4.1. When a train is assisted by a self-propelled passenger train, restrictions will apply depending upon the type of train that is assisting and the load of the disabled train. When emergency couplers are used to enable different types of trains to be coupled together, speed and other restrictions will apply.
- 4.2. The Operator's representatives must be consulted before assisting a disabled train with a diesel multiple unit train.
- 4.3. An **XPT** train must not be used to propel any other train.

5. PROPELLING A DISABLED TRAIN FROM THE REAR

- 5.1. NOTE: Additional requirements from Country Regional Network Rule **CNTR 416 Disabled trains** apply to propelling a disabled train from the rear.

- 5.2. An **XPT** train must not be used to propel a disabled train.

5.3. Assisting a disabled passenger train from the rear

- 5.3.1. The Operator's representatives must be consulted before assisting a disabled diesel multiple unit train from the rear.
- 5.3.2. Before a **vintage, historical or steam hauled train** is assisted from the rear, such a movement must be authorised by the Operator and the Network Manager
- 5.3.3. A disabled **locomotive hauled passenger train** must only be assisted in the rear to the first suitable location where the train can be remarshalled to allow it to be hauled. An **XPT** train cannot be propelled from the rear.
- 5.3.4. When assisting a disabled passenger train from the rear with one or more locomotives, or with a locomotive hauled train,
Refer to clause 4 of the CRN TOC Manual Section 2, Locomotive Operations.

5.4. Maximum speed when assisting a disabled train from the rear

- 5.4.1. When a disabled train is being assisted from the rear and the driver at the front of the train has full control of the automatic air brake of both the assisting and disabled trains, the train may travel at normal speed, providing there are no other restrictions applying to the vehicles on the train and/or emergency couplers are not being used.
- 5.4.2. When a disabled train is being assisted from the rear and the driver at the front is only able to operate the emergency cock at the front of the train, or an emergency coupler is being used to couple the two trains, the maximum speed must not exceed **25 km/h**.
- 5.4.3. When a disabled train is being assisted from the rear and the automatic air brake of both the assisting and disabled trains is controlled by the driver of the assisting train only, that is the driver at the front of the train cannot control the air brake or operate the emergency cock, the speed of the train must not exceed **10 km/h**. There must be full radio communication between the drivers of both trains. If full radio communication between the drivers of both trains is not available, then the assisting movement **must not** proceed.
- 5.4.4. When a diesel multiple unit train is being assisted from the rear by a locomotive hauled train, the speed of the train must not exceed **25 km/h**.

6. HAULING A DISABLED TRAIN FROM THE FRONT

6.1. A disabled train may be hauled from the section by attaching the assisting train or locomotive/s at the front of the disabled train in the direction of travel. The draw strength of any vehicle in the combined train consist must not be exceeded.

6.2. Hauling a disabled passenger train

6.2.1. Wherever possible, a disabled **vintage, historical or steam hauled train** should be hauled rather than assisted in the rear from a section.

6.3. Maximum speed when hauling a disabled train

6.3.1. When a disabled train is being hauled and the driver at the front of the train has full control of the automatic air brake of both the assisting and disabled trains, emergency couplers are not being used **and** when no other restrictions apply to any of the vehicles on the train, the train may travel at normal speed.

7. USING AN EMERGENCY COUPLER

Some train types are not fitted with a conventional knuckle type automatic coupler, but are equipped with an emergency coupler (aka transition coupler) that will enable the train to couple to other types of vehicles with conventional type automatic couplers. Trains requiring emergency couplers include: XPT, Xplorer, Endeavour and other self-propelled diesel trains.

7.1. NOTE: Additional requirements from Country Regional Network Rule **CNTR 416 Disabled trains** apply to using an emergency coupler.

7.2. The Operator's representatives must be consulted before assisting a disabled train using an emergency coupler.

7.3. For all trains, **except XPT Trains**, when coupled using an **emergency coupler**, the speed of the train must not exceed **25 km/h**.

7.4. XPT Trains

7.4.1. XPT train consists comprising of up to two (2) power cars and up to seven (7) trailer cars may be hauled by a locomotive up to the maximum permitted locomotive speed, and not exceeding the permissible normal track speed.

7.4.2. XPT trains shall not be propelled from the rear with an emergency coupler, except in the case of a propelling shunting movement at a maximum speed of **10 km/h**.

7.5. General Operating Conditions When Using Emergency Couplers

7.5.1. A suitable locomotive shall be used to haul a disabled consist. The brake pipe must be continuous throughout the train and controlled from the hauling locomotive.

7.5.2. When using an emergency coupler, only the automatic air brake must be used at all times. The following equipment must not be used: locomotive independent brake (including independent release), dynamic brake or electro-pneumatic (EP) brake (where fitted).

7.5.3. Where possible when assisting a disabled multiple unit train, the brake pipe pressure of the assisting locomotive or the locomotive on the assisting train should be reduced to a pressure compatible with that of the disabled train.

7.5.4. Due to weight restrictions and manual handling requirements, the strength of an emergency coupler is limited. The driver of the assisting train must limit the amount of tractive effort required to move the train in order to minimize impacts or unnecessary force through the emergency coupler.

7.5.5. Care must be taken when coupling trains with emergency couplers to vehicles that are fitted with buffers, broad buffer beams or diaphragm plates. These vehicles must not be coupled together unless there is adequate clearance around the emergency coupler to accommodate coupler swing on tight curves.

7.5.6. When an emergency coupler has to be used to propel a train in the rear, the train shall only be assisted to the first suitable location where the train can be remarshalled or the vehicle detached.



WARNING

8. ASSISTING DISABLED TRACK MAINTENANCE VEHICLES

8.1. Assisting a disabled track maintenance vehicle with a locomotive or train

- 8.1.1. A locomotive or train may be used to assist a disabled track maintenance vehicle using an approved towing device, emergency coupler, or automatic couplers. A disabled track maintenance vehicle may be assisted in the rear by a locomotive or train fitted with a compatible coupler.
- 8.1.2. Where possible, the disabled vehicle should have main reservoir air supply, and have an operable emergency parking brake.

9. DEFECTIVE AIR BRAKE EQUIPMENT

- 9.1. NOTE: Additional requirements from Country Regional Network Rule **CNTR 404 Using brakes**.

- 9.2. The air brake should be operational on every vehicle of a train. However, whilst in service, it is permissible to cut out a certain number of brakes on a train as detailed below.
- 9.3. The brake pipe must be continuous throughout the train consist and all intermediate brake pipe coupling cocks open.
- 9.4. The air brake on a vehicle or bogie must only be cut out where it is not practical to repair the vehicle in situ.
- 9.5. If the brakes are cut-out, the vehicle must be appropriately identified or ticketed. The Operator must ensure that train operating personnel and maintenance personnel are informed of any brake cut-outs.

9.6. Locomotive hauled trains

- 9.6.1. The maximum number of vehicles with inoperative or cut-out brakes (including locomotives) in a train must not exceed 1 in 10 vehicles. **OR**
- 9.6.2. The total unbraked mass of the train with brakes cut-out (including locomotives) must not exceed 10 per cent of the train hauled mass, **whichever requirement is the more restrictive**.
- 9.6.3. The leading locomotive must have an operative air brake on at least one bogie. If the air brake on one bogie only of a locomotive is cut-out, then the unbraked mass of that vehicle is half the locomotive mass.
- 9.6.4. Vehicles with inoperative or cut-out air brakes must be repaired as soon as practicable.

9.7. Freight trains

- 9.7.1. For multipack vehicles, the number of cut-out vehicles is equal to the number of vehicles/platforms/decks that is controlled from the inoperative or cut-out triple or distributor valve.
For example: A 5-pack articulated vehicle has two triple/distributor valves. Each valve controls the brakes on three (3) bogies, that is, 2-1/2 platforms. If one triple/distributor valve is cut-out, this is counted as two and a half platforms/decks with brake cutouts.
- 9.7.2. A freight train should be marshalled such that a vehicle with an operative air brake is placed on each side of an unbraked vehicle and an unbraked vehicle must not be one of the last three (3) vehicles on the train.
- 9.7.3. If the brakes on one of the last three (3) vehicles on the train is found to be inoperative or has to be cut-out enroute, the train may continue at a maximum speed of 50 km/h to the first suitable location where the train shall be remarshalled, the defective vehicle repaired or detached. In addition, if the vehicle with defective brakes is the last vehicle on the train, an emergency towing chain must be attached between the last and second last vehicles.

9.8. Freight trains – with ECP brakes

- 9.8.1. All ECP braked trains shall be operated in the “run” or normal operating mode when travelling across the CRN.
- 9.8.2. The owner/operator of an ECP braked train shall have procedures in place for train recovery in the event of an ECP brake failure.
- 9.8.3. Any vehicles or platforms with defective ECP brake systems are assumed to have a defective air brake and trains containing such defects are to be restricted in the same manner as pneumatically braked trains.

9.9. Locomotive hauled passenger trains

- 9.9.1. A locomotive hauled passenger train must not leave a maintenance centre or depot with any air brake inoperative or brakes cut out.
- 9.9.2. If a defect occurs on the last vehicle of a passenger train, enroute, and the vehicle is conveying passengers, the passengers must be relocated to other cars, and a qualified worker must travel in the last vehicle, and be prepared to apply the handbrake or spring parking brake. The train may travel up to a maximum speed of 25 km/h to the first suitable location where the train shall be remarshalled or the defective vehicle repaired or detached.
- 9.9.3. If the brakes on one of the second or third last vehicle on the train is found to be inoperative or has to be cut-out, enroute, the train may continue at a maximum speed of 50 km/h to the first suitable location where the train shall be remarshalled, the defective vehicle repaired or detached.
- 9.9.4. If the last vehicle is a freight vehicle, an emergency towing chain must be attached between the last and second last vehicles and the train proceed at a speed not exceeding 50 km/h.

9.10. Diesel multiple unit trains

- 9.10.1. A diesel multiple unit train must not leave a maintenance centre with any air brake inoperative.
- 9.10.2. If a brake fault occurs enroute, a train may continue in service at normal speed provided not more than one (1) bogie in eight (8) bogies is cut-out and no two (2) bogies on either end car are cut out.
- 9.10.3. If more than one (1) bogie in eight (8), but no more than one (1) bogie in four (4), are cut-out the train must be worked out of service at a speed not exceeding 80 km/h.
- 9.10.4. If more than one (1) bogie in four (4), but not more than three (3) bogies in eight (8), are cut out, the train must be worked out of service at a speed not exceeding 25 km/h.
- 9.10.5. If more than three (3) bogies in eight (8) are cut out, or two (2) bogies on either end vehicle are cut out, the train must be considered as disabled, and must not be moved until it has been attached to another train or locomotive.
- 9.10.6. If a failure of the electro-pneumatic brake system occurs, and the defect cannot be repaired, the EP brake must be switched off and the automatic air brake (Xplorer or Endeavour) or straight air brake (other diesel multiple unit trains) used to control the train.
- 9.10.7. If a failure also occurs in the straight air brake system and the defect cannot be repaired (diesel multiple unit trains), the train must be worked out of service at a maximum speed of 25 km/h using the brake pipe emergency cock as an emergency brake.

9.11. Braking problems when descending steep grades

- 9.11.1. Where a driver has difficulty in recharging the brake pipe on a train, the train must be brought to a stand before releasing the brakes.
- 9.11.2. Where the vehicles in the train are fitted with grade control valves, these valves must be placed in the next holding position before proceeding. If valves are in 'EX' they shall be placed in 'IP'; if in 'IP' they shall be placed in 'HP'.
- 9.11.3. If there is any doubt with regard to the braking performance of the train, the train is not to proceed. The train must be brought to a stand, the handbrakes applied and assistance sought.

9.12. Locomotives

- 9.12.1. Where a locomotive has an automatic air brake fault which prevents the operation of the automatic air brake throughout the train, the train must have the handbrakes applied and the defective brake valve must be cut-out. The train must be assisted out of the section in accordance with Country Regional Network Rule **CNTR 416 Disabled trains**.

9.13. XPT trains

9.13.1. An XPT train must not leave a maintenance centre with any air brake inoperative.

9.13.2. If a failure of the electro-pneumatic brake system occurs during operation, and the defect cannot be repaired, the EP brake must be switched off and the automatic air brake used to control the train.

9.13.3. An XPT train consisting of 2 power cars and 5 or more trailer cars may continue in service at normal speeds provided that not more than 12.5% of the bogie brakes are cut out. Refer to the following table for brake cut-out allowances and appropriate operating conditions.

NOTE: For the purposes of calculating brake cut-outs, an XPT power car bogie shall be treated as being equivalent to two (2) trailer car bogies.

Bogie Brake cut-outs per XPT Train			2 Power Cars + 5 Trailer cars (18 equivalent bogies)		2 Power Cars + 7 Trailer cars (22 equivalent bogies)	
Power Car Bogie Cut-outs	Trailer Car Bogie Cut-outs	Total Equivalent Bogie Cut-outs	% Bogies Cut-out	Operating and/or Speed Restriction	% Bogies Cut out	Operating and/or Speed Restriction
0	1	1	6%	No speed reduction	5%	No speed reduction
0	2	2	11%	No speed reduction	9%	No speed reduction
0	3	3	17%	Worked out of service at 80 km/h maximum	14%	Worked out of service at 80 km/h maximum
0	4	4	22%	Worked out of service at 80 km/h maximum	18%	Worked out of service at 80 km/h maximum
0	5	5	28%	Worked out of service at 25 km/h maximum	23%	Worked out of service at 80 km/h maximum
0	6	6	33%	Worked out of service at 25 km/h maximum	27%	Worked out of service at 25 km/h maximum
0	7	7	39%	Not to move until attached to another train or locomotive	32%	Worked out of service at 25 km/h maximum
0	8	8	44%	Not to move until attached to another train or locomotive	36%	Worked out of service at 25 km/h maximum
1	0	2	11%	No speed reduction	9%	No speed reduction
1	1	3	17%	Worked out of service at 80 km/h maximum	14%	Worked out of service at 80 km/h maximum
1	2	4	22%	Worked out of service at 80 km/h maximum	18%	Worked out of service at 80 km/h maximum
1	3	5	28%	Worked out of service at 25 km/h maximum	23%	Worked out of service at 80 km/h maximum
1	4	6	33%	Worked out of service at 25 km/h maximum	27%	Worked out of service at 25 km/h maximum
1	5	7	39%	Not to move until attached to another train or locomotive	32%	Worked out of service at 25 km/h maximum
1	6	8	44%	Not to move until attached to another train or locomotive	36%	Worked out of service at 25 km/h maximum
2 (1 per power car)	0	4	22%	Worked out of service at 80 km/h maximum	18%	Worked out of service at 80 km/h maximum
2 (1 per power car)	1	5	28%	Worked out of service at 25 km/h maximum	23%	Worked out of service at 80 km/h maximum
2 (1 per power car)	2	6	33%	Worked out of service at 25 km/h maximum	27%	Worked out of service at 25 km/h maximum
2 (1 per power car)	3	7	39%	Not to move until attached to another train or locomotive	32%	Worked out of service at 25 km/h maximum
2 (1 per power car)	4	8	44%	Not to move until attached to another train or locomotive	36%	Worked out of service at 25 km/h maximum
3	0	Not to move until attached to another train or locomotive				

9.13.4. Where an XPT power car requires both bogies to be cut-out, the train is not to be moved until attached to another train or locomotive.

10. DEFECTIVE BRAKE PIPE

10.1. Where the brake pipe on a vehicle is broken and brake pipe pressure cannot be maintained for the operation of the automatic air brake, the disabled train must be removed from the section either with the assistance of another train or by dividing the train. The defective vehicle must be detached from the train at the first suitable location.

10.2. Locomotive hauled freight and passenger trains

10.2.1. When assisting a train with a defective brake pipe, from the rear, the adjacent brake pipe **coupling cocks** on the vehicles either side of the defective vehicle must be closed. The train must then be worked at a speed not exceeding **10 km/h** to the first suitable location where the defective vehicle can be detached or repaired. The train brakes must be controlled by the respective locomotive attached to each portion of the train, either side of the defective vehicle. Radio communication between respective train crews is essential for this operation to proceed. If radio communication is lost then the movement shall not proceed.

10.2.2. Where the disabled train is conveying passengers and the defective vehicle cannot be detached the passengers must be de-trained at the first suitable location.

10.2.3. Where the disabled train is to be divided and the defective vehicle becomes the last vehicle on the train, the brake pipe coupling cock on the rear of the second last vehicle must be closed and the air brake on the defective vehicle released. An emergency towing chain must be used between the defective vehicle and the second last vehicle.

10.2.4. Where a disabled passenger train has to be divided, all passengers must be redistributed into cars in front of the defective vehicle. A Passenger Train Guard or qualified worker must then travel in the last (defective) car and be prepared to apply the internal handbrake or spring parking brake. Effective communication must be maintained between the qualified worker and the locomotive crew.

10.2.5. Where there is insufficient passenger space in front of the defective vehicle, all passengers must be redistributed into cars behind the defective vehicle and the train divided. After securing the rear portion of the train with hand/parking brakes, the front portion of the train shall be worked to the nearest suitable location where the remaining cars shall be detached and secured. A Passenger Train Guard or qualified worker must travel in the last (defective) car and be prepared to apply the internal handbrake or spring parking brake. Effective communication must be maintained between the qualified worker and the locomotive crew.

10.2.6. After securing the defective car and associated cars, the locomotive shall return to pick up the remainder of the train.

10.3. Diesel multiple unit trains

10.3.1. Where the defective vehicle is either the leading or rear car, and the hand brake or all spring parking brakes do not operate on that car, then the train is a total failure and must only be moved with the assistance of a locomotive or another train.

10.3.2. Where the defective vehicle cannot be detached, all passengers must be detrained at the next suitable location. The train must then be worked out of service.

10.3.3. This type of train usually has a main reservoir pipe and therefore the train may complete its trip providing the electro-pneumatic (EP) brake is working on the entire train. In the event of an EP brake failure, the driver must operate the train from the end which will give control of the automatic brake on the greatest number of cars. The Passenger Train Guard or qualified worker must ride in the end car at the opposite end of the train and be prepared to apply the automatic air brake, handbrake or spring parking brake when requested by the driver.

10.3.4. In the event that the driver is driving from the rear portion of the train then the Train Guard or qualified worker must ride in the leading vehicle and convey signal information to the driver via intercom or radio. Radio/intercom communication is essential for this operation to proceed.

10.3.5. The speed of the train must not exceed **25 km/h**.

10.3.6. Where the disabled train is to be divided, the defective vehicle becomes the last vehicle on the train. The brake pipe coupling cock on the rear of the second last vehicle must be closed and the air brake on the defective vehicle released. An emergency towing chain must be used between the defective vehicle and the second last vehicle.

11. DEFECTIVE MAIN RESERVOIR PIPE ON PASSENGER TRAINS

- 11.1. Where the defective vehicle is either, the leading, or rear vehicle and the hand brake or spring parking brake does not operate on that vehicle, then the train is a total failure and must only be moved with the assistance of a locomotive or another train.
- 11.2. Where the defective vehicle is either the leading or rear vehicle, and has a working handbrake then the train can continue as normal and be worked out of service.
- 11.3. Vehicle air springs, where fitted, are supplied from the main reservoir pipe. In the event of a main reservoir supply failure, one or more air springs may deflate and may have to be isolated. Refer to **Defective air springs** for operating conditions:
 - 11.3.1. Trains with the complete vehicle main reservoir pipe isolated and with no air in the bogie air springs, but the brake pipe is continuous throughout the train, may travel at a normal speed but in accordance with that permitted for defective air springs.

12. DEFECTIVE AIR SPRINGS

- 12.1. Where a diesel multiple unit train has a defective air spring on one (1) bogie of one (1) or more cars, the train may continue its journey at a speed as specified in the Operator's procedures.
- 12.2. The train must then be worked out of service.

13. DEFECTIVE HANDBRAKE OR PARKING BRAKE

- 13.1. NOTE: Additional requirements from Country Regional Network Rule **CNTR 404 Using brakes**.
- 13.2. **Passenger trains**
 - 13.2.1. Where a defective vehicle is a non-terminal car, the train may continue in service until it returns to a maintenance facility.
 - 13.2.2. Where a defective vehicle is a terminal car, and it has one (1) spring parking brake operable, the train may continue in service until it returns to a maintenance facility.
 - 13.2.3. Where a defective vehicle is a terminal car that is not permanently coupled, and does not have a fully operable handbrake or spring parking brake, the train is considered to be a total failure and therefore may only be moved when attached to an assisting locomotive or train.
 - 13.2.4. Where a defective vehicle is a permanently coupled terminal car with no fully operable handbrake or spring parking brake, the train may continue in service until it returns to a maintenance facility.
 - 13.2.5. Where the spring parking brake or automatic air brake on a vehicle is locked on, the vehicle may be dragged clear of the section with the approval of the owner/operator before the brakes are released and isolated. Refer to the section covering defective wheels.

14. DEFECTIVE WHEELS

- 14.1. NOTE: Additional requirements from Country Regional Network Rule **CNTR 412 Defective running gear and CRN Standard CRN RS 015- Wheel Defect Standard**.

Serious damage can occur to the track when wheels of locomotives or vehicles skid or when scale builds up on the wheel due to sticking brakes. Train crews, shunter/examiners and vehicle maintenance staff must make every effort to ensure that brakes are operated and maintained correctly.

The following information is an extract from CRN Standard CRN RS 011.


- 14.1.1. If a locomotive or vehicle with flat spots (skidded wheels) or scale (scaled wheels) on its wheels is detected in service, depending on the severity of the case, it may be kept marshalled on a train, **provided** that the wheels have been inspected and certified fit to run by the Operator's representative.
- 14.1.2. The Operator's representative may be the train driver, the Operator's maintenance personnel or any other person nominated by the Operator as being suitably qualified to assess the situation.
- 14.1.3. The locomotive or vehicle must operate in accordance with the instructions below.
- 14.1.4. **Precautions**

When it is suspected that the wheels have flats or there is a build-up of scale on the wheels of any locomotive or vehicle, the train must be stopped at the first suitable safe location.

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- 14.1.5. All the wheels on the vehicle/s in question must be inspected to determine the extent of the wheel skid or the amount of scale build-up. If the length of the wheel skid is not greater than 100mm, or the scale build-up is less than 15mm: the train may be driven at a speed not exceeding that specified below to the nearest suitable location, in order to clear the section **and** have the defective locomotive or vehicle detached.
- 14.1.6. If there is any doubt as to the class of skid or scale condition, the more severe condition must be reported.


Permissible speeds for scale build up on wheels per CRN RS 011

Scale class	Scale height	Maximum speed
3	Surface scale up to 1 mm	Normal operation after checking brakes
4 (i)	Over 1 mm and up to 5 mm	25 km/h only to clear the section
4 (ii)	Over 5 mm and up to 10 mm	15 km/h only to clear the section
4 (iii)	Over 10 mm and up to 15 mm	5 km/h only to clear the section
5	Over 15 mm  WARNING:	The vehicle must not be moved until it has been examined, the defect adequately rectified and certified fit to travel by a qualified worker

Notes:

- The brakes on any vehicle with the exception of a light locomotive or single self powered vehicle, which has experienced wheel scale build-up, must be isolated before the vehicle is allowed to travel.
- Once a locomotive or vehicle has been removed from the section because of wheel scale the affected wheels must be descaled to at least the equivalent of a class 3 condition before re-entering traffic.
- Vehicles having suffered class 4 or 5 scale build-up must have all wheel treads and flanges checked by a qualified worker for evidence of thermal cracking, before re-entering traffic. If cracks are detected the appropriate action must be in accordance with the Operator’s maintenance procedures.

Permissible speeds for wheel skid length per CRN RS 011

Skid class	Length of wheel skid	Maximum speed
1	Single skid less than 25 mm	Normal operation after checking brakes
2	Single skid between 25 mm and 40 mm or multiple class 1 skids on the same wheel	80 km/h operation
3	Single skid between 40 mm and 60 mm or multiple class 2 skids on the same wheel	40 km/h only to clear the section
4	Single skid between 60 mm and 100 mm or multiple class 3 skids on the same wheel	25 km/h only to clear the section
5	One or more skids over 100 mm or multiple class 4 skids on the same wheel.  Warning:	The vehicle must not be moved until it has been examined, the defect adequately rectified and certified fit to travel by a qualified worker

Notes:

- The qualified worker is a qualified mechanical maintenance person attached to an operator’s rolling stock maintenance depot/breakdown crew.
- The brakes on any vehicle with the exception of a light locomotive or single self powered vehicle, which has experienced wheel skid flats, must be isolated before the vehicle is allowed to travel.
- Two or more locomotives with class 3 or 4 skids cannot be operated in multiple when being transferred for wheel turning purposes, unless all wheels have been adequately repaired to the equivalent of a class 3 (dressed) condition.
- Locomotives with class 3 or 4 skids cannot work a train for the purposes of transfer for wheel turning purposes, unless all wheels have been adequately repaired to the equivalent of a class 3 (dressed) condition.

Permissible travel distances and speeds after clearing the track section due to wheel skids

Skid class	Maximum distance	Maximum speed
Class 3 [dressed]	1000 km	80 km/h
Class 4 [welded & dressed]	1000 km	40 km/h
Class 5 [welded & dressed]	1000 km	40 km/h
Class 3	500 km	25km/h
Class 4 [dressed]	500 km	25 km/h
Class 4	50 km	25 km/h

Notes:

- In the case of class 3 and 4 skids the edges of the skid may be dressed by grinding to reduce the severity of the skid to the next lowest category.
- In the case of Class 4 and 5 skids the flat may be built up by welding and dressed by grinding to reduce the severity to the equivalent of a Class 3 (dressed) skid.

A speed limit of **40 km/h** is applicable to Class 4 and 5 weld repaired skids to ensure against wheel fracture in the weld area.

14.2. Thermal cracks

14.2.1. Thermal cracks are usually transverse, across the wheel tread, and, if allowed to grow without corrective action, can develop to the point where the wheel will fracture.

14.2.2. Many shallow thermal cracks can be removed by machining but extra care must be used to ensure that the crack has been completely eliminated in the operation. If thermal cracks are found on a wheel, then the vehicle's brake system should be checked for evidence of dragging brakes (sticking brakes).

14.2.3. If there is the slightest doubt as to the severity of the Thermal Crack, always report the higher classification. (For example, if the defect description falls between a Class 2 and 3 Thermal Crack, then a Class 3 Thermal Crack would be reported).



WARNING

Permissible speeds for wheels with thermal cracks per CRN RS 011

Thermal crack class	Crack length & location	Permissible operation
1	Up to 10 mm long on the tread surface within area 30 mm from wheel gauge face and 12 mm from rim face.	Normal operation after checking brakes
2	Between 10 and 30 mm long on the tread surface within area 30 mm from wheel gauge face and 12 mm from rim face	Normal operation after checking brakes. Condition of wheels to be monitored.
3	Between 30 and 40 mm long on the tread surface within area 30 mm from wheel gauge face and 12 mm from rim face	<p>Locomotives and passenger vehicles: Normal operation after checking brakes. Wheels to be turned within 14 days.</p> <p>Diesel multiple unit vehicles: Normal operation after checking brakes. Wheels to be inspected every 14 days.</p> <p>Freight vehicles: Vehicle to be worked out of service for repairs.</p>
4	Over 10 mm long and within 30 mm from the flange face or within 12 mm from the rim face. OR Over 40 mm long on the tread surface within area 30 mm from wheel gauge face and 12 mm from rim face	Vehicle may continue to its scheduled destination and/or be transferred to the nearest repair location at a maximum speed of 40 km/h providing the brakes are isolated (passenger and freight) or the use of independent brake kept to an absolute minimum (locomotives).

15. DEFECTIVE DRAWGEAR

15.1. NOTE: Additional requirements from Country Regional Network Rule **CNTR 412 Defective running gear**.

15.2. Where the coupler or drawgear of a vehicle is found to be defective enroute, an emergency towing chain shall be attached between the defective vehicle and the adjacent vehicle/locomotive.

15.3. The emergency towing chain must be at least 16 mm high tensile chain.

15.4. If the trailing load behind the towing chain exceeds the maximum allowable trailing load listed below, then the train must be divided and the defective vehicle hauled as the last vehicle to the first suitable location where it can be detached.

15.5. Emergency towing chain

15.5.1. An emergency towing chain must only be used to move a defective vehicle or vehicles where the drawgear is broken or defective and in the case where the last vehicle is defective and the automatic air brakes have been cut out or the handbrake is defective.

15.5.2. The towing chain must not be used if the trailing load behind the towing chain exceeds the limits in the following table:-

Ruling Grade	Maximum trailing load for towing chain
1 in 30	255 tonne
1 in 33	255 tonne
1 in 40	265 tonne
1 in 50	320 tonne
1 in 60	375 tonne
1 in 66	400 tonne
1 in 70	420 tonne
1 in 75	445 tonne
1 in 80	465 tonne
1 in 90	510 tonne
1 in 100	550 tonne
1 in 110	590 tonne
level	1000 tonne

15.5.3. Refer to the **TOC General Instruction pages, Section 1 Route Standards or section location pages** for ruling grades.

16. TRANSFERRING DEFECTIVE VEHICLES

16.1. NOTE: Additional requirements from Country Regional Network Rule **CNTR 414 Defective vehicles**.

16.2. Vehicles not to be moved

16.2.1. Vehicles with defects such as excessively hot axle bearings or Class 5 wheel skids or Class 5 scale must not be moved until they have been inspected by a qualified worker and repaired or made safe to move. The qualified worker is a qualified mechanical maintenance person attached to an operator's rolling stock maintenance depot/breakdown crew. In either case that person shall have rolling stock maintenance experience.

16.2.2. A pony bogie may be used to transfer such vehicles.

16.3. Pony bogies

16.3.1. The **correct type** of pony bogie must be used for the vehicle being moved. The Operator is responsible for ensuring that the correct pony bogie is used for the application.

16.3.2. Defective locomotives, or loaded freight vehicles, supported by pony bogies must be accompanied by a qualified worker, and that qualified worker must take every opportunity to examine the assembly and bearings. The maximum speed at which the locomotive and loaded freight vehicles are to travel is **15 km/h**, reduced to **8 km/h** over points and crossovers.

16.3.3. Empty freight and empty passenger type vehicles supported by pony bogies can travel unaccompanied and travel at **20 km/h**, reduced to **10 km/h** over points and crossovers.