



# Rail Operating Code

## Code Supplement CS 4.19

### Operating Instructions for Te Huia SR Class Carriages and DFB Locomotives

Issue number	Prepared (P) Reviewed (R) Amended (A)	Approved by	Authorised for release by
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## **1.0 TRAINING AND CERTIFICATION**

Staff will be trained and certified as per the appropriate Training Specification

## 2.0 ABBREVIATIONS

BR	British Rail
BP	Brake Pipe
DA	Diesel Generator
DMI	Driver Interface Machine
EP	Equalising Pipe
ETP	Electronic Train Protection
LCD	Liquid Crystal Display
MR	Main Reservoir
PC	Pneumatic Control
PA	Public Address
PEB	Passenger Emergency Brake
PTT	Push to Talk
TM	Train Manager
TMS	Train Monitoring System

### 3.0 GENERAL

An SR train is comprised of carriages obtained from British Rail, the earliest of which dates from the 1964 – 1975. These cars are all steel construction and originally had doors at each end of the carriage that hinged outwards.

The carriages were extensively refurbished at Hillside Workshops from 2003 – 2010. The refurbishment included a complete refit of the interior, new electrical systems, a new braking system and new sliding carriage doors at the  $\frac{1}{4}$  and  $\frac{3}{4}$  positions on the side of the carriage.

They were retired from suburban Auckland train use in 2015 when new electric trains were introduced.

In 2019 / 2020 the carriages underwent upgrading at Hutt Workshops into SR carriages with modern safety features, a café and customer comfort additions. There are three types of carriage:

- SR (Scenic Regional)
- SRC (Scenic Regional Catering) now with a café, servery and wheelchair hoist and wheelchair help points.
- SRV (Scenic Regional Vehicle) ex driving carriage with diesel-electric generator sets for supplying power to the carriages.

The SRV contains a generator that can power up to 6 carriages, the SRV, 4 SR and 1 SRC. If more than six carriages are on the train, mechanical staff will restrict the maximum number of carriages on the train or isolate electrical loads.

### 3.1 Carriage Features

	SR	SRC	SRV
Single side door	✓	-	-
Double side door	✓	✓	✓
End door	✓	✓	✓ (cab end)
Wheelchair lifter	-	✓	-
Wheelchair spaces	-	✓ (2)	-
Café	-	✓	-
Luggage racks	✓	-	✓
Bike spaces	-	-	✓
Seats	50	17	36
Toilet	✓	✓ (wheelchair)	-
Office	-	-	✓
Driving cab	-	-	✓
Bike slots	-	-	✓
Emergency exit ladder	-	-	✓ (4)
Generator	-	-	✓

### 3.2 Carriage Seating Capacity

	Seated	Standing (see below)	Totals	Crush loaded (1 standing for 1 seated)
SR	50	42	92	154
SRC	17	24	49	136
SRV	38	22	60	102
<b>4 car totals</b>	<b>155</b>		<b>293</b>	<b>546</b>

Refer to KiwiRail Rail Operating Code Section 1: Rolling Stock Restrictions for running rights and speed limits.

### 3.3 SR Carriage

Length over drawgear	20,377 mm
Overall width	2,744 mm
Overall height	3,626 mm
Floor height	1,068 mm
Tare	35,000 kg
Seating capacity	92 passengers Made up of 50 seats, 20 seat grab handles and 16 using the metal poles in the 4 doorways

### 3.4 SRC Carriage

Length over drawgear	20,377 mm
Overall width	2,744 mm
Overall height	3,626 mm
Floor height	1,068 mm
Seating capacity	49 passengers Made up of 17 seats, 4 flip-up seats, 5 seat grab handles, 8 using the weather shield stanchions in the 2 doorways and 15 hand straps

### 3.5 SRV Carriage

Length over drawgear	15,856 mm
Overall width	2,580 mm
Overall height	3,715 mm
Tare	35,840 kg
Seating capacity	60 passengers Made up of 26 seats, 12 flip-up seats, 10 seat grab handles and 12 using the weather shield stanchions in the 2 doorways and the 2 half doorways

### 3.6 DFB Modifications

Selected DFB locomotives are modified to a 'new universal passenger locomotive' standard. They are currently used on the 'Te Huia' Hamilton – Auckland passenger train and will eventually be rolled out to other passenger trains.

These locomotives have:

- Additional equipment and controls fitted in the cab to monitor the carriage safety and door systems.
- New jumper cable sockets on the headstock to electrically connect the carriages safety and door systems to the locomotive.
- The three H2A DFB locomotives additionally have been fitted with Electronic Train protection (ETP) for operation in the Auckland suburban area.

The Locomotive Engineer has improved information about critical systems in the carriages:

- Door open or closed status
- External door open while the train is moving
- Pressure changes in the suspension air bags
- Activation of the passenger emergency brake and the ability to override if it is not in a safe place to stop
- Air conditioning settings
- Smoke detector / fire alarms
- Park brake status

These locomotives can still operate on freight and passenger services that are not fitted with the new systems.

#### 3.6.1 Carriage Systems Monitored

- Activation of a smoke detector
- Airbag deflated
- External door open while the train is moving
- Park brake applied
- Passenger Emergency Brake switch (PEB) activated

### 3.6.2 Locomotive Features

New panels with warning lights and buttons above the Locomotive Engineers front window and next to the speedometer.

Different warning sounds for the new alarms.

The Tranzlog monitors many of the systems.

- Carriage Controls:
  - Air conditioning fresh air intake, open / close
  - Park brake, apply / release.
  
- Door Controls:
  - Door release
  - Door close indication
  - 'Right of Way' gong from the onboard staff
  - Emergency release
  
- Hard wired intercom to the carriages
- Jumper cable sockets (4) one on each side of the front and rear headstocks
- Ability to override a Passenger Emergency brake activation
- Train Monitoring System (TMS) information panel
- Traction interlock – no traction power while the doors are open
- On the H2A locomotives an ETP DMI panel has been fitted underneath the driver's lunch tray

### 3.7 Throttle Restrictions

**CAUTION:** When driving from the SRV cab in push mode, the following throttle restrictions will apply:

The locomotive throttle must not be used above Notch 4:

- Turnout No.7 at Whangamarino @ 598.836km
- Turnout No.3B at Amokura @ 604.395km

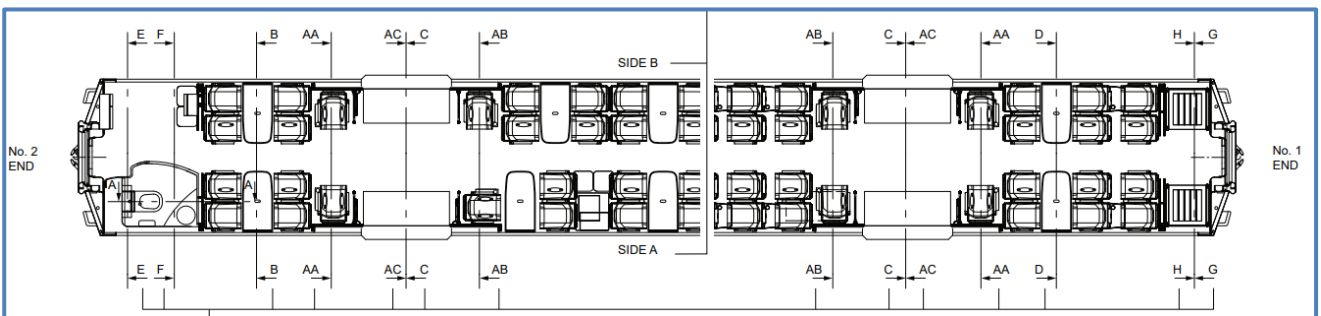
This is to ensure that the rear carriage does not derail in the event of a sudden loss of power.

## 4.0 GENERAL DIAGRAMS

### 4.1 SR Carriage

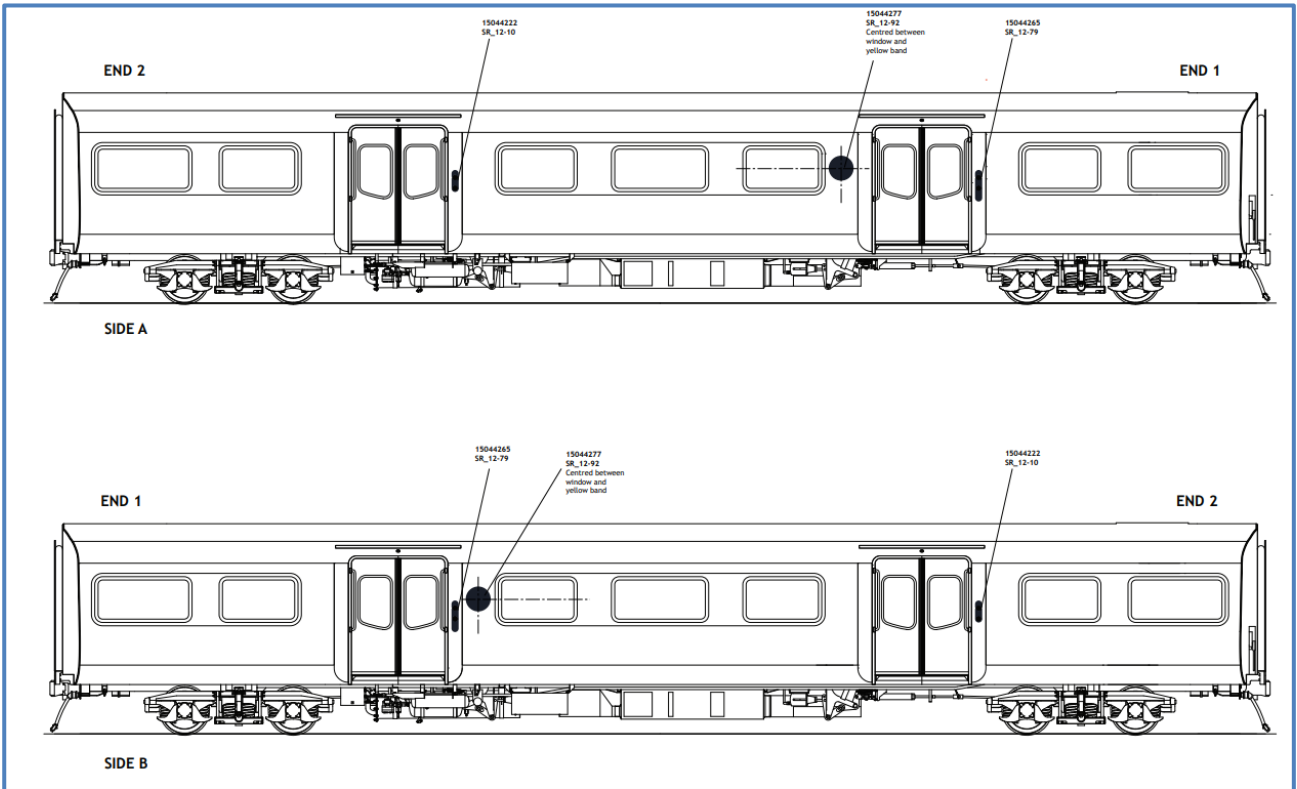


Side Elevations

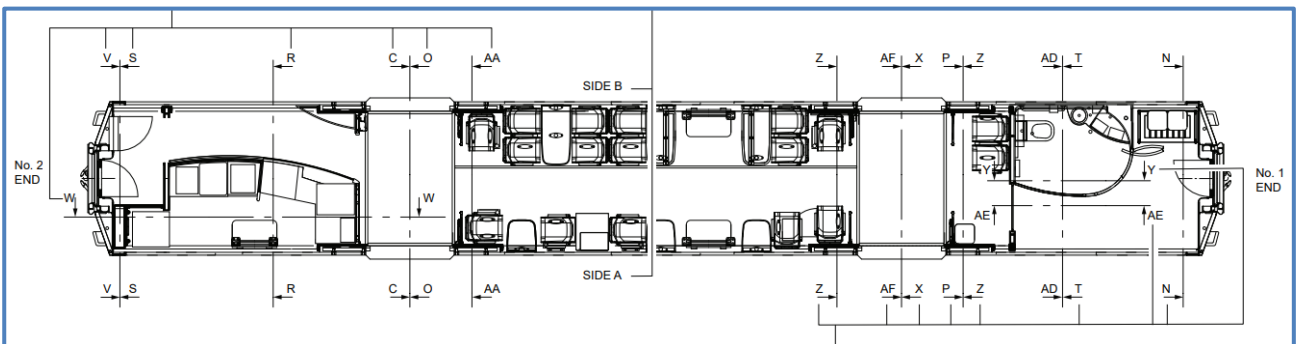


Internal Layout

## 4.2 SRC Carriage

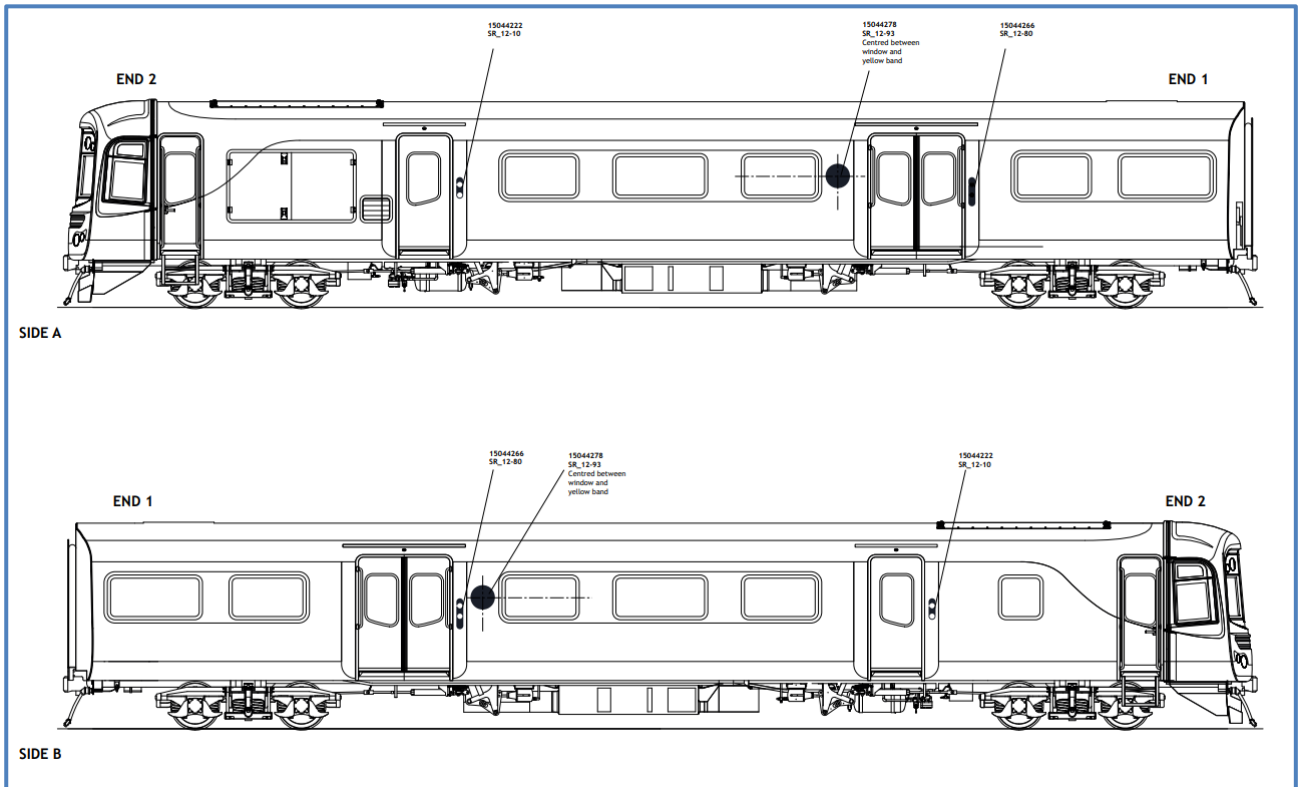


Side Elevations

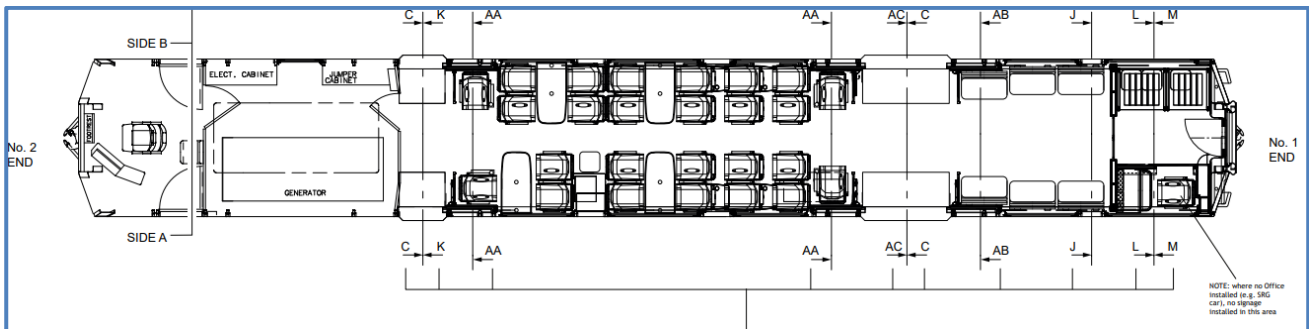


Internal Layout

### 4.3 SRV Carriage



Side Elevations



Internal Layout

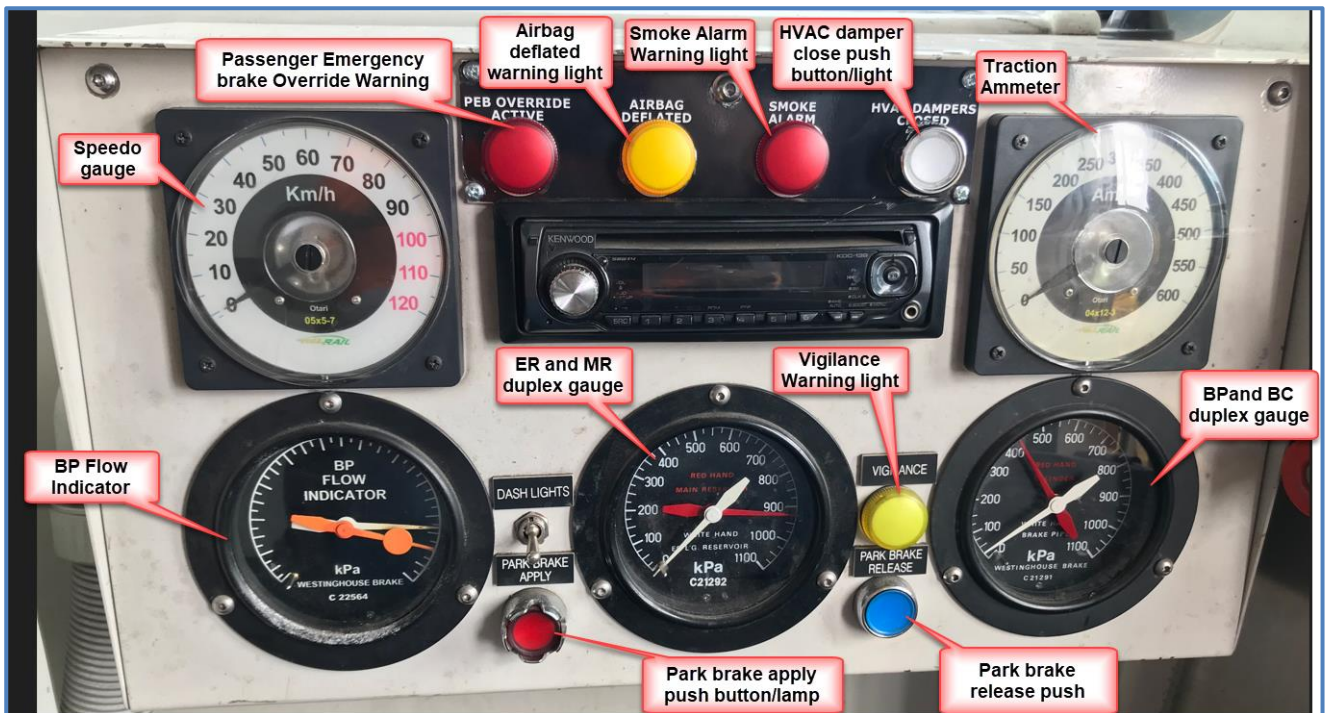
## 5.0 CAB CONTROLS AND LAYOUT

The SRV cab is used by the Locomotive Engineer to control the locomotive using a similar technique to operating a locomotive in multiple. The Locomotive Engineer can control the direction, throttle and dynamic brake of the locomotive using a standard DX type controller in the SRV cab.

The Locomotive Engineer is able to control the train’s brakes from the SRV cab:

- The Automatic Brake Valve controls the brake pipe pressure and hence the entire trains brakes (including the locomotive when set up in Trail 24).
- The Independent Brake Valve allows the Locomotive Engineer to apply the brakes on the locomotive independently to the train’s brakes.

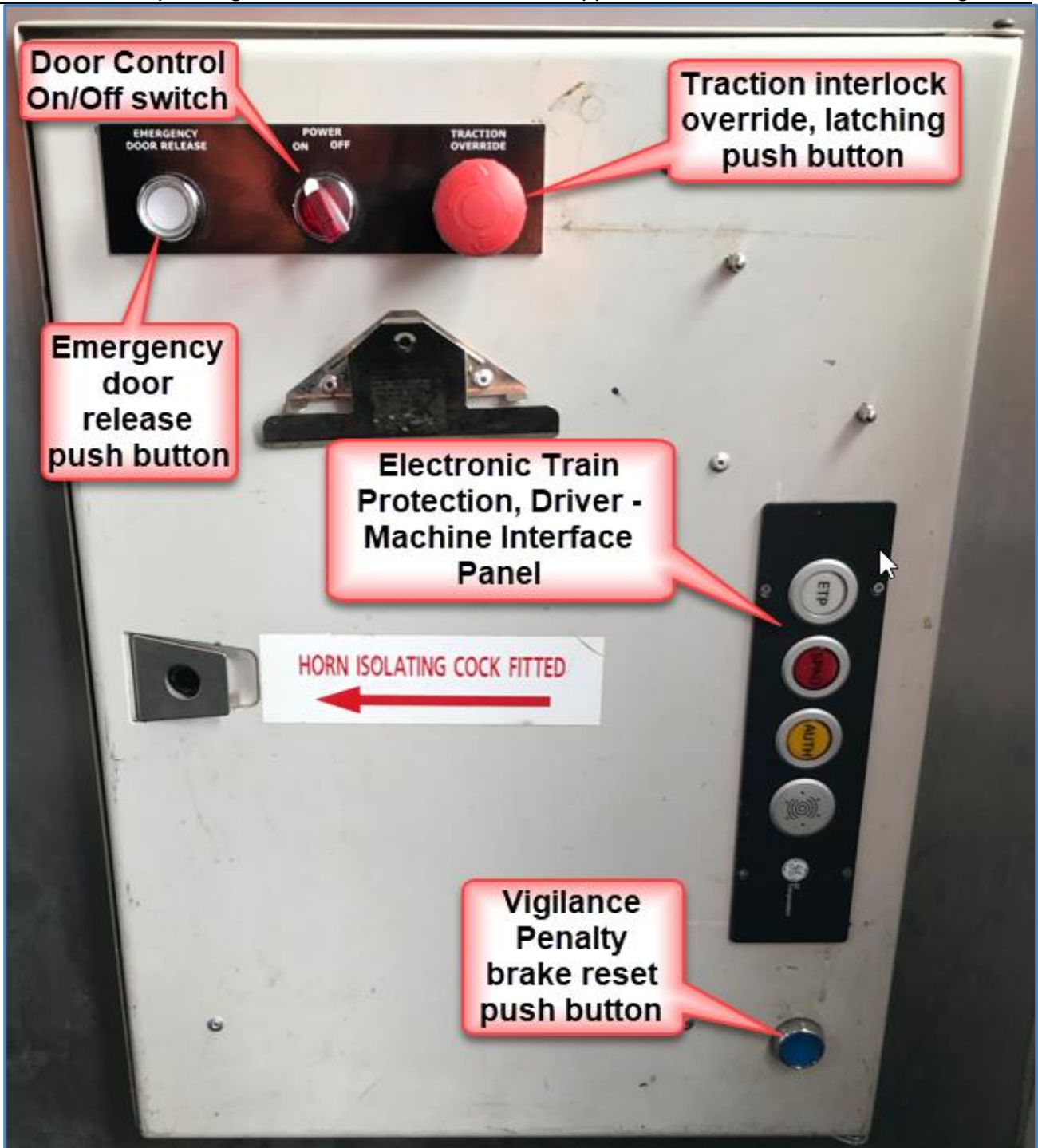
**NOTE:** The locomotive brakes **cannot** be bled off from the SRV cab, this has been done for safety reasons, and similarly the brakes on the SRV car **cannot** be independently applied or released.



SRV gauge panel controls, indicators and gauges



SRV cab locomotive-style control stand



SRV Cab Side Panel Controls

<p>Carriage smoke alarm activated <b>red</b> light</p>	<p>Carriage Park Brake apply push button <b>red</b> light</p>	<p>Carriage Park Brake release push button <b>green</b> light</p>	<p>Locomotive traction override button</p>	
<p>Carriage airbag deflated yellow light</p>				<p>Freight or Universal passenger selector switch</p>
<p>Passenger Emergency Brake (PEB) override <b>red</b> light</p>				<p>Carriage Train Management System (TMS)</p>
<p>HVAC damper close-open push button white light</p>				<p>Emergency door release override push button white light</p>
<p>Carriage to Locomotive intercom handset</p>				<p>All doors closed <b>blue</b> light (shown with baffle down)</p>
<p>PEB override acknowledge button with <b>red</b> light</p>				
	<p>Door release push button white light</p>		<p>Alarm silence push button white light</p>	

DFB gauge panel controls, indicators and gauges



DFB Electronic Train Protection Cab Controls

## 5.1 Gauge Control

Ammeter: The amps indicated on the SRV ammeter replicates that displayed on the ammeter in the locomotives cab.

The entertainment radio / CD player speaker is muted when the radio speaker is in use.

Additional controls have been added as indicated:

- Air bag deflated indication light
- Park Brake Apply push button with an integral Brake On light
- Park Brake Release push button

## 5.2 Control Stand Layout and Functionality

### 5.2.1 Alarm Silence push button

If this button is pressed while the smoke or air bag alarm sounds, it will only stop the sound, the fault still exists.

When the button illuminates with a white light, this indicates that the alarm silence is active

**NOTE:** If a second alarm is activated, the alert tone will not sound.

### 5.2.2 FRT / PASS selector switch

FRT Position	PASS position
Lead , Trail or Dead on a: <ul style="list-style-type: none"> <li>• Freight train</li> <li>• Passenger train not fitted with new universal passenger systems monitored from the locomotive</li> </ul>	Lead locomotive on: <ul style="list-style-type: none"> <li>• SR and other carriages that have the new universal passenger system monitored from the locomotive</li> </ul>

### 5.2.3 HVAC Dampers closed

Use to open / close the fresh air intake in the passenger cars.

If...	Then
Train about to enter a tunnel or travel through smoke (caused by nearby fire)	Press the HVAC Dampers closed button. The button will have a red light.
Train exited tunnel or in clean air again	Press the HVAC Dampers closed button. The red light will extinguish

### 5.2.4 Park Brake apply

Step	Action
1.	When asked to apply park brakes, press the red 'PB Apply' button
2.	When a least one of the park brakes are applied the red apply button will illuminate

### 5.2.5 Park Brake release

Step	Action
1.	When asked to release park brakes, press the green 'PB Release' button
2.	When the park brakes have released the red apply button will extinguish

### 5.2.6 Carriage Smoke alarm

Carriages are fitted with smoke alarms monitored by the TMS and an alarm light / sounder is in the cab.

When an alarm has activated in the carriage it indicates internal smoke in the carriage.

Step	Action
1.	<b>Red</b> 'Smoke Alarm' light illuminates, sounder activates.
2.	Get the train to a place where it is safe to evacuate all the passengers then slow the train immediately.
3.	Contact the Train Manager, if unable to make contact, stop the train.
4.	Send an emergency base call to train control.
5.	Take a fire extinguisher go back the train and try to contact the train crew.

### 5.2.7 Passenger Emergency Brake (PEB)

These carriages are fitted with a new type of PEB that when activated by a passenger, sends an electrical signal to the cab. If the Locomotive Engineer does not acknowledge the alarm within 10 seconds it vents the brake pipe from the locomotive.

Step	Action	
1.	PEB activated in a carriage	
2.	PEB button illuminates red and warning buzzer sounds	
3.	<b>If...</b>	<b>Then</b>
	<p>The location is a safe place to stop a passenger train</p> <p>The location is an unsafe location to stop a passenger train</p>	<p>1. Stop the train</p> <p>2. Contact the Train Manager to gain more information</p> <p>1. Press the red override button by the speedometer within 10 seconds of the alarm starting</p> <p>2. The PEB override light illuminated red</p> <p>3. Contact the Train Manager to gain more information</p> <p>4. Continue to a location where it is safe to stop the train</p> <p>5. Once stopped, twist the PEB override button to reset the alarm</p>
4.	PEB button will stay illuminated red until the train crew locate and reset the carriage PEB switch	

### 5.2.8 Traction Override button

The locomotive cannot get traction power when the passenger doors are open.

If there is a fault with the door circuit, this button will allow the locomotive to gain traction power.

If...	Then...
Door closed blue light illuminated	<ol style="list-style-type: none"> <li>1. Operate the Traction Override button.</li> <li>2. Record the fault in the 54D book and iPad</li> </ol>
Door closed blue light not illuminated	<ol style="list-style-type: none"> <li>1. Contact the Train Manager to get them to open and close all doors</li> <li>2. If the door closed blue light does not illuminate, physically check the electrical jumper between the locomotive and carriage is secure at both ends</li> <li>3. Get the Train Manager to visually check all doors are closed</li> </ol> <p>If the above checks find all equipment is normal:</p> <ol style="list-style-type: none"> <li>4. Operate the Traction Override button</li> <li>5. Record the fault in the 54D book and iPad</li> </ol>

The Traction Override button can be cancelled by turning anti-clockwise.

### 5.2.9 Control Circuit Breaker

The 74V DC control circuit required to drive the locomotive is brought from the locomotive directly to the Control Circuit breaker on the bottom right of the control stand. In order for the Locomotive Engineer to control the locomotive from the SRV cab, this circuit breaker must be switched ON.

### 5.2.10 Communication and Entertainment Radio

The communication and entertainment radio is powered by a 24V DC circuit breaker. This circuit breaker is located in the generator room electrical cabinet, along with the radio circuit breaker on the bottom right hand side of the control stand. Both of these circuit breakers must be on for the radio to operate.

### 5.2.11 Generator Field Switch

The generator field circuit on the locomotive can be isolated by turning the generator field switch in the SRV cab OFF. This achieves the same result as if the generator field switch on the locomotive itself has been turned OFF.

**NOTE:** The generator field switch on the locomotive must be OFF in order for this switch in the SRV car to control the generator field circuit on the locomotive.

### 5.2.12 Sand

When the sand button is pressed, this sends a signal back to the locomotive to allow sand to be applied in front of the leading wheelset on the locomotive.

### 5.2.13 Horn

When the horn push button is pressed, this operates a solenoid valve that provides air to operate the dual tone horn located behind the cow catcher on the front of the SRV car.

The ditch lights will also flash when the horn is blown.

### 5.2.14 Signal Alert

The Locomotive Engineer may push the Signal Alert button when passing a signal at “Warning” the Signal Alert light will illuminate to indicate it is active. At approximately 400 metres from the point the button was pressed the Signal Alert Light and audible warning will begin to pulse for 6 seconds and then stop.

### **5.2.15 Headlight Alert**

This blue button flashes and an audible alarm sounds when the forward direction has been selected without the headlights being turned on. Turning the headlights on will cancel the alarm, alternatively pressing the push button will stop the audible alarm for 5 minutes and leave the blue light on constantly.

### **5.2.16 Penalty Brake Reset Button**

The penalty brake reset button is located on the door of the bottom right cabinet in the cab.

## **5.3 Train Monitoring System**

Refer Instruction 8.8

## **5.4 Warning Lights and Alarms**

### **5.4.1 PC Open Warning Light**

PCR Warning and alarm sounds in the SRV cab when the air pressure in the main reservoir supplied through the main reservoir pipe from the locomotive reduces below 425 kPa or the brake pipe pressure reduces below 375 kPa.

### **5.4.2 Wheelslip Warning Light**

The wheelslip warning light is trainlined through from the locomotive, so the Locomotive Engineer is made aware of any wheelslip that maybe occurring on the locomotive.

### **5.4.3 Dynamic Brake Warning Light**

The dynamic warning light is trainlined through from the locomotive.

#### **5.4.4 Alarm Bell**

The alarm bell is trainlined through from the locomotive, so the Locomotive Engineer can be made aware of any alarms in the locomotive (PC Open, Engine Run Failure, Engine Temperature, and Low Oil Pressure).

#### **5.4.5 Alarm Test Button**

The alarm test button allows all the warning lights to be tested to ensure they are still operational (i.e. there are no blown bulbs).

#### **5.4.6 Air Bag Deflated Warning Light**

This light indicates that an airbag has been deflated. It also indicates that the overspeed setting in the Tranzlog has been reduced to 55 km/h

#### **5.4.7 Park Brake Applied Warning Light**

This light is on if there is a lack of air pressure to the park brake system of a car.

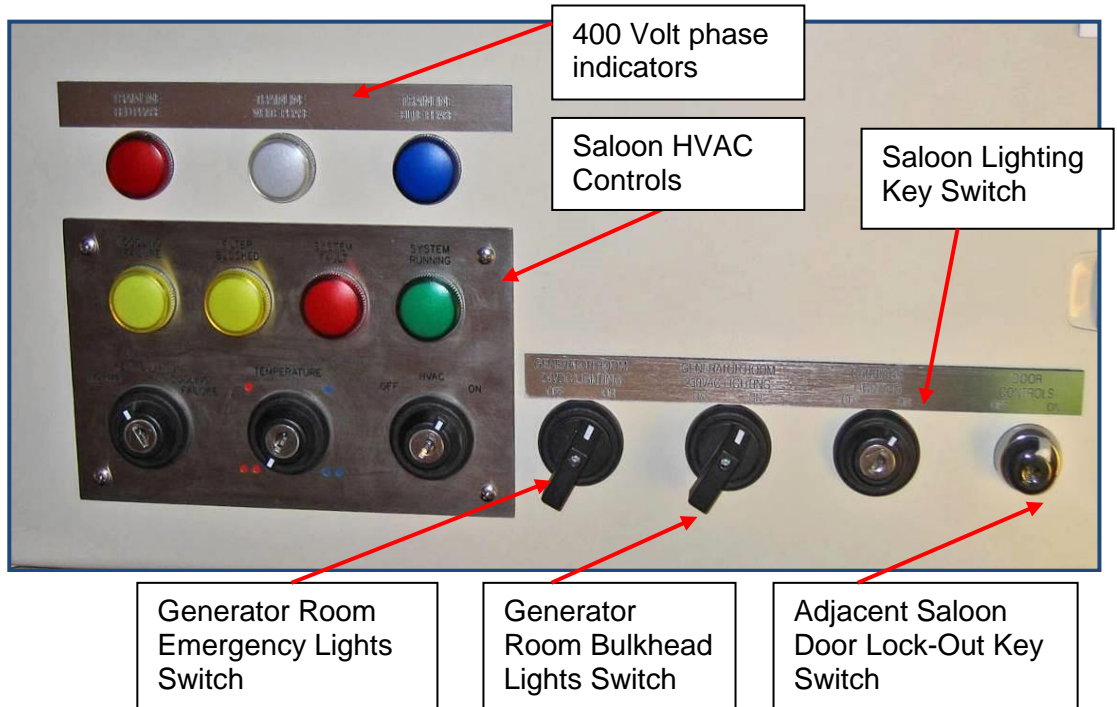
### **5.5 Cab and Generator Room Lighting**

#### **5.5.1 Cab Spot Lights**

The marker light switch located on the top right hand side of the control stand turns on the two reading / spot lights on each side of the cab ceiling. These spot lights can be swiveled to direct the light in the desired direction. These lights are powered from the 24V DC circuit breaker No.9 located in the generator room electrical cabinet.

### 5.5.2 Cab Side Lights

The side light switch located on the right hand side of the control stand turns on the 230V AC lights mounted on the ceiling on each side of the SRV cab. These lights provide a low level light that can be used when driving at night (The generator must be running for these lights to operate).



Generator room lighting and air conditioning controls

### 5.5.3 Cab Central Light

The main central 230V AC florescent light is turned on using the switch located on the back wall of the cab, beside the generator door (The generator must be running for this light to operate).

### 5.5.4 Generator 230V AC Lights

There are three bulkhead lights in the generator room. These lights operate on the 230V AC supply and are turned on using the switch on the electrical cabinet (The generator must be running for these lights to operate).

### **5.5.5 Generator Emergency 24V DC Lights**

A single 24V DC emergency light is located above the walkway in the generator room. This light is turned on using the switch on the electrical cabinet.

## **5.6 Auxiliary Lighting**

The auxiliary lights operate off 24V DC circuit breaker No.9 in the generator room electrical cabinet.

### **5.6.1 Marker Lights**

The marker light switch located on the top right hand side of the control stand turns on the two white LED lights at the front bottom corners of the SRV.

### **5.6.2 Tail Lights**

The tail light switch located on the top right hand side of the control stand turns on the two red LED lights at the top front corner of the SRV.

### **5.6.3 Coupler and Step Lights**

The coupler and step lights switch located on the top right hand side of the control stand turns on the white LED light located directly above the front coupler and the LED strip lights located above the cab door step ladders.

### **5.6.4 Gauge Lights**

The gauge light switch is located on the gauge console. The gauge lights provide back-lit illumination of the gauges on the gauge console.

## 5.7 Headlights / Ditchlights

For the headlights to operate, the 24V DC circuit breaker No.8 in the generator room 24V DC electrical cabinet must be switched on, as must the main DC switch.

The headlight switch has 3 positions:

- OFF – All Headlights and Ditchlights off.
- DIM – Headlights are dipped and Ditchlights are Dim Beam
- FULL – Headlights and Ditchlights on Full Beam

### 5.7.1 Ditchlight Flashing

When the ditchlight flasher button is pressed, or the horn is operated, the ditchlights will flash alternatively on FULL beam for approximately 20 seconds, and then return to the state they were previously at (i.e. back to being on FULL or DIM beam).

## 5.8 Windscreen

### 5.8.1 Windscreen Demister

A 1kW fan heater is located in the front wall of the cab. This fan heater provides warm air to circulate across the central front windscreen to ensure that it remains clear when condensation tends to form on the windscreen.

The fan heater switch for the central windscreen is located on the right hand side of the control stand. This demister should only be turned on when it is necessary to do so.

### 5.8.2 Windscreen Wipers

The windscreen wiper switch has 3 positions:

- OFF – The windscreen wipers move to the “Park” position and remain there.
- LOW – All three windscreen wipers operate at “low” speed.
- HIGH – All three windscreen wipers operate at “high” speed.

### **5.8.3 Windscreen Washer Button**

The windscreen washer button enables water to be squirted out of the nozzles in each of the 3 windscreen wiper blades. Hold down the windscreen washer button and operate the windscreen wipers until the windscreen has been cleaned.

### **5.8.4 Windscreen Washer Bottle**

A 20 litre reservoir of water for the windscreen washer is provided inside the DA set.

## **5.9 Cab Equipment**

The standard cab equipment is provided for the Locomotive Engineers; this includes hand wipes, wet wipes, rubbish bin, and coat hooks. These are all located in the cab.

To minimize clutter in the cab; the tool bag, document and first aid bins, detonators and portable radio are located in the generator room.

## **5.10 Foot Warmer**

The switch on the right hand side of the control stand switches on the foot warmer located in front of the adjustable foot rest (The DA Set must be running for the foot warmer to operate).

## 5.11 Air Conditioning Unit

The cab has its own separately controlled air conditioning unit. The Locomotive Engineer can select the desired cab temperature using the remote control. The remote control is mounted on the front wall (The generator must be running for the cab air conditioning to operate).

<b>Controls:</b>	<b>Function:</b>
<b>On / Off</b>	Press this button and the unit starts automatic operation, pressing it again turns the unit OFF.
<b>Temperature</b>	Set the desired temperature by using the up and down arrows.
<b>Mode</b>	Pressing this button cycles through the units different modes (Automatic, Dry, Cool, Fan and Heat).
<b>Fan</b>	This button controls the desired fan speed. At start up, the fan speed is set to automatic.
<b>Flap</b>	This button controls the direction of airflow.

## **6.0 PRE START PROCEDURES**

### **6.1 Pre Trip Inspection**

Check the Loco 54D Repair Book.

Ensure that the locomotive hand brake is applied.

Inspection of the locomotive is covered in the appropriate Rail Operating Code Supplement Operating Instructions

### **6.2 General Inspection**

The SR car set is a locomotive hauled passenger train.

Refer to Rail Operating Code Section 5.3, Instruction 6.3.2: Passenger Train Inspection for the items to be checked before the train enters service.

In addition:

- Check the fuel, oil and water levels in the generator set
- Check that the emergency equipment in the cars is present and in good condition
- Check the emergency train stop cocks in passenger compartments are closed

## **7.0 START UP PROCEDURE**

### **7.1 Disconnect Electrical Shore Supply**

1. If the depot shore supply is connected to the SRV carriage, turn off the shore supply and disconnect the cable
2. Stow the cable in the storage position ensuring the weatherproof cover on the cable closes.
3. When the cable is disconnected, the dummy cover on the shore supply socket on the SRV must be replaced to protect the pins.

### **7.2 Disconnect Air Shore Supply**

1. Close the MR coupling cock on the carriage.
2. Close the MR supply cock.
3. Open the top drain cock to drain the high air pressure from the hoses. When the pressure is released, close the top drain cock.
4. Uncouple the supply hose from the MR hose.
5. Couple the carriage MR hose to its dummy.
6. Recoil the supply hose.

## 8.0 OPERATING

**NOTE: Information on SR-car set running rights, maximum passenger loadings and permissible speeds is contained in Rail Operating Code Section 1: Rolling Stock Restrictions: Passenger Restrictions.**

### 8.1 Graduated Release Brakes

All SR carriages are fitted with WG1 triple valves. The WG1 triple valves have a graduated release capability which means that in addition to the brakes being able to be applied gradually in steps, they can also be released gradually in steps.

The locomotive and carriage brakes are capable of being applied, then partially released to any point between full service and release and can then be re-applied a further number of times; this is known as Graduated Release. The air supply that feeds the brake cylinders is being constantly topped up out of the Main Reservoir on each car (fed by the MR pipe) to ensure brake cylinder air is always available.

If a brake application is made and then the brake handle is moved part way back towards release, the brake cylinder pressure will reduce according to the new handle position.

With the graduated release brakes on both the locomotive and carriages, there will always be air pressure in the brake cylinders after a brake pipe reduction, until the brake pipe is **fully** recharged again. If the locomotive automatic brake application is left applied as recommended, the locomotive brake cylinder pressure will mimic the brake cylinder pressure on the carriages.

The emergency brake cylinder pressure on the SR carriages is the same as the full service brake cylinder pressure. In emergency the speed of the brake application is faster due to the faster brake pipe discharge rate.

## 8.2 Emergency Brake

An emergency brake application occurs when the brake pipe pressure falls to zero. This will occur by:


- Pressing the emergency brake push button at any saloon door station
- Pressing the emergency brake push button in the cab
- A penalty brake application initiated by the Tranzlog event recorder


If a saloon door emergency stop push button has been pressed, the Train Manager is to ascertain the reason and advise the Locomotive Engineer. A red strobe light on the ceiling of each car will flash if the emergency push button has been pressed at a door station on that car.

## 8.3 SRV Generator

### 8.3.1 Start Up from SRV Cab


This is the preferred start method



Step	Action
1.	Turn on the 24V circuit breaker in the SRV carriage
2.	Check that all mains power circuit breakers are OFF in the carriages. This reduces the load on the generator starting
3.	<div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p>Confirm the Generator / Shore supply switch is in the Generator position</p> </div> <div style="flex: 2;">  </div> </div>

Step	Action
4.	<p>Check the generator emergency stop button has been reset – twist anti-clockwise</p>  <p>In the cab, move the Generator Remote switch from STOP to RUN</p>

### 8.3.2 Start Up from Generator Room

This is an alternative method if the cab control failed

Step	Action
1.	Turn on the 24V circuit breaker in the SRV carriage
2.	Check that all mains power circuit breakers are OFF in the carriages. This reduces the load on the generator starting
3.	<p>Confirm the Generator / Shore supply switch is in the Generator position</p> 

Step	Action
4.	<p>Open the gull wing door on the generator to access the start station</p> 
5.	<p>Check the generator emergency stop button has been reset – twist anti-clockwise</p>
6.	
7.	<p>Close the generator compartment door and lock</p>

**8.3.3 Shut Down**

Step	Action
1.	Turn off all the main and 24V circuit breaker on all carriages
2.	Go to SRV cab start station
3.	<div data-bbox="486 472 1283 960" data-label="Image"> </div> <p data-bbox="486 974 1404 1048">In the cab, move the Generator Remote switch from Run to STOP</p>
4.	Wait 3 minutes until the generator stops

**8.3.4 Emergency Shut-down**

The generator can be shut down using any of the two generator emergency stop buttons located:

- Generator Control Panel (inside generator compartment)
- SRV back cab wall to the left of the door

Located above the door in the generator room, a fire strobe light and siren will operate when:

- An alarm condition exists
- The fire suppression system has activated
- Fire suppressing agent has been released into the engine bay.

**IMPORTANT:**

- When fire suppressing agent has been discharged the generator compartment doors are not to be opened for at least 20 minutes
- A portable fire extinguisher must be on hand when the doors are open
- Generator must not be started until repair personnel have attended

## 8.4 Cab Set Up / Changing Cabs

Changing driving ends does not affect the integrity of the brake pipe, only the valves controlling the brake pipe pressure have changed.

Therefore, it can be accepted that the brakes on the train will continue to respond normally to brake pipe pressure changes.

The purpose of the brake check described in this section is to ensure that the new lead brake valve is correctly controlling the brake pipe and therefore the brakes on the train.

### 8.4.1 Brake Test Procedure:

Locomotive leading and SRV as the last vehicle:

- Cut in controls ensuring that the train will not experience inadvertent movement, ensuring that the cars reservoirs have been recharged by momentarily placing the automatic brake valve to release and the brake pipe rising to 550 kPa, before starting the test. (This will ensure the volume reservoirs restore to 500 kPa).
- Upon communication (from the Train Manager or second person) that test is to commence, place independent brake to a level where brake cylinder pressure will be significantly lower than full service yet high enough to ensure that the set will not roll once the automatic brake is released. (The SRV brake cylinder gauge will register the higher of the locomotive or SRV brake cylinder pressure therefore requiring the locomotive brake cylinder pressure reduction for the subsequent test – this could be approximately 150-200 kPa).

- The Locomotive Engineer release the automatic brake and wait for communication to APPLY brake.
- The second person observes the SRV brake cylinder gauge and watches it settle at 150-200 kPa.
- The second person requests the brake APPLY and observes that the brake cylinder pressure rises above the level set during the last stage of the test.
  - If satisfied, this is communicated to the Locomotive Engineer using the approved communication or ROW gong as deemed appropriate by the Operating Companies.
  - If not satisfied, an inspection must occur by the crew to understand the issue and the train not proceed.

SRV leading and locomotive as the last vehicle:

- Cut-in controls ensuring that the train will not experience inadvertent movement, ensuring that the car reservoirs have been recharged by momentarily placing the automatic brake valve to release and the brake pipe rising to 550 kPa, before starting any test.  
(This will ensure the volume reservoirs restore to 550 kPa).
- Upon communication (from the Train Manager or second person) that test is to commence, ensure the independent brake is applied if not already, then place automatic brake to a level where brake cylinder pressure will be high enough to ensure that the set will not roll during the next stage of the test.
- With the second person standing beside the locomotive, they request brake RELEASE. The Locomotive Engineer places the SRV independent brake to full release. (The style of test performed above with the SRV trailing will not apply – the locomotive gauge only reads the pressure of the locomotive brake cylinders).
- The second person observes whether the locomotive brake pistons stay extended or retract.
  - If the locomotive brake pistons remain extended, the test has been satisfied.
  - If the locomotive brake pistons do not remain extended, the test has failed, an inspection must occur by the crew to understand the issue and the train does not proceed.

**NOTE:** It is preferable to perform the tests after passenger transfer has occurred – some trains may be stopped sufficiently drafted or buffed in their drawgear that a perceptible movement may occur when brakes fully released from that state. This would be undesirable whilst passenger exchange occurring.

#### 8.4.2 Rolling Brake Test:

Where is physically impractical or unsafe because of platform heights or access to the track is restricted, a “Rolling Brake Test” must be undertaken:

Check for correct set-up and once the service is authorised to depart (ROW and signal), the Locomotive Operator must:

- Commence movement
- At a speed not exceeding 25 km/h, and in Notch 1 – 4
- Make a brake application (between 75 – 100 kPa)

Once the Locomotive Operator feels the brakes apply to the level expected and retards forward movement, the train brakes can be released. This confirms that the brakes are operative throughout the service and normal running may resume.

If the service fails to slow in any noticeable fashion, the Locomotive Operator **must** immediately apply the emergency brake, stop the train, and advise Train Control.

If after the appropriate checks have been made to ensure the brakes have been correctly set, and the fault cannot be rectified, the service must immediately be removed from commercial service.

### 8.4.3 To prepare to drive from the Locomotive Cab

<b>Set Up SRV Cab as follows:</b>	
1.	Centralise the reverser and remove the handle. Place the Independent Brake Valve handle in the full service position.
2.	Place the Automatic Brake Valve handle in the “ <b>Handle Off</b> ” position (This ensures that the brake pipe pressure is reduced to below 100kPa) Make sure that the brake cylinder pressure rises to 350 kpa
3.	Turn the 26C brake valve cut off valve to the “ <b>Out</b> ” position once the brake pipe pressure has ceased dropping.
4.	Turn the <b>MU2A</b> valve to the <b>Trail 24</b> position.
5.	Place the Independent Brake Valve handle in the “ <b>Release</b> ” position.
6.	Switch off the headlights and ditchlights Switch on the tail lights Switch the Generator Field Switch <b>OFF</b>
7.	Switch off the Passenger Door Control Switch
8.	Secure this cab and proceed to the other driving cab.

<b>Set Up Locomotive as follows:</b>	
1.	Switch off the tail lights Switch on the headlights and ditchlights Switch the Generator Field Switch <b>ON</b> Switch the Engine Run Switch <b>ON</b> Switch the passenger door control switch from “ <b>Freight</b> ” to “ <b>Pass</b> ”.
2.	Move the Independent Brake to the full service position.
3.	Place the <b>MU2A</b> Cut Off Valve in the “ <b>Lead</b> ” position.
4.	Place the 26C Brake Valve Cut Off Valve to the “ <b>PASS</b> ” position.
5.	Move the Automatic Brake Valve to the “ <b>Release</b> ” position. Wait 1 minute before using the automatic brake
6.	Carry out a brake functionally test (Refer to Instruction 8.1)

#### 8.4.4 To prepare to drive from the SRV Cab

<b>Set Up Locomotive Cab as follows:</b>	
1.	Centralise the reverser and remove the handle. Place the Independent Brake Valve handle in the full service position.
2.	Place the Automatic Brake Valve handle in the “ <b>Handle Off</b> ” position (This ensures that the brake pipe pressure is reduced to below 100kPa) Make sure that the brake cylinder pressure rises to 350 kpa
3.	Turn the 26C brake valve cut off valve to the “ <b>Out</b> ” position once the brake pipe pressure has ceased dropping.
4.	Turn the <b>MU2A</b> valve to the <b>Trail 24</b> position. (refer Note 1)
5.	Place the Independent Brake Valve handle in the “ <b>Release</b> ” position.
6.	Switch off the headlights and ditchlights Switch on the tail lights
7.	Leave the Control and Fuel Pump Switches <b>ON</b> (refer Note 2) Switch the Generator Field Switch <b>OFF</b> Switch the Engine Run Switch <b>OFF</b>
8.	Switch the passenger door control switch to “ <b>Freight</b> ” position
9.	Secure the cab and proceed to the other driving cab.
1.	<b>NOTE:</b> If the locomotive is placed into the <b>Trail 6 / 26</b> position, the brakes on the locomotive <b>will not</b> respond to an automatic brake application. It is essential that the <b>Trail 24</b> position is used.  If the Trail 6 / 26 position is used, the locomotive’s brakes will only respond to independent brake applications.
2.	<b>NOTE:</b> If the Control and Fuel pump switch is turned <b>off</b> , as is done for a normal trail locomotive setup, it will not be possible to operate the locomotive from the SRV cab.

<b>Set Up SRV Cab as follows:</b>	
1.	Switch off the tail lights Switch on the headlights and ditchlights
2.	Move the Independent Brake to the full service position.
3.	Place the <b>MU2A</b> Cut Off Valve in the “ <b>Lead</b> ” position.
4.	Place the 26C Brake Valve Cut Off Valve to the “ <b>PASS</b> ” position.
5.	Move the Automatic Brake Valve to the “ <b>Release</b> ” position. Wait 1 minute before using the automatic brake
6.	Ensure that the Control Circuit Breaker is ON Ensure that the Radio Circuit Breaker is ON Switch the Generator Field Switch ON Switch on the passenger door controls. (Red switch on the front right cabinet door)
7.	Carry out a brake functionally test (Refer to Instruction 8.1)
<p><b>NOTE:</b></p> <p>When the SRV car is leading, the locomotive is under the control of the SRV cab’s throttle control as for normal trailing locomotives. The exception is the locomotive headlight controls are not trainlined through in the usual manner.</p> <p>The Brake Pipe must be reduced to below 100kPa when changing ends to allow the control reservoirs on each of the cars to be correctly charged.</p> <p>If this is not done, the brakes on the cars may not fully release when the brake pipe is fully charged form the other end.</p>	

### 8.5 Smoke Detectors

Smoke detectors are ceiling mounted throughout the carriage.

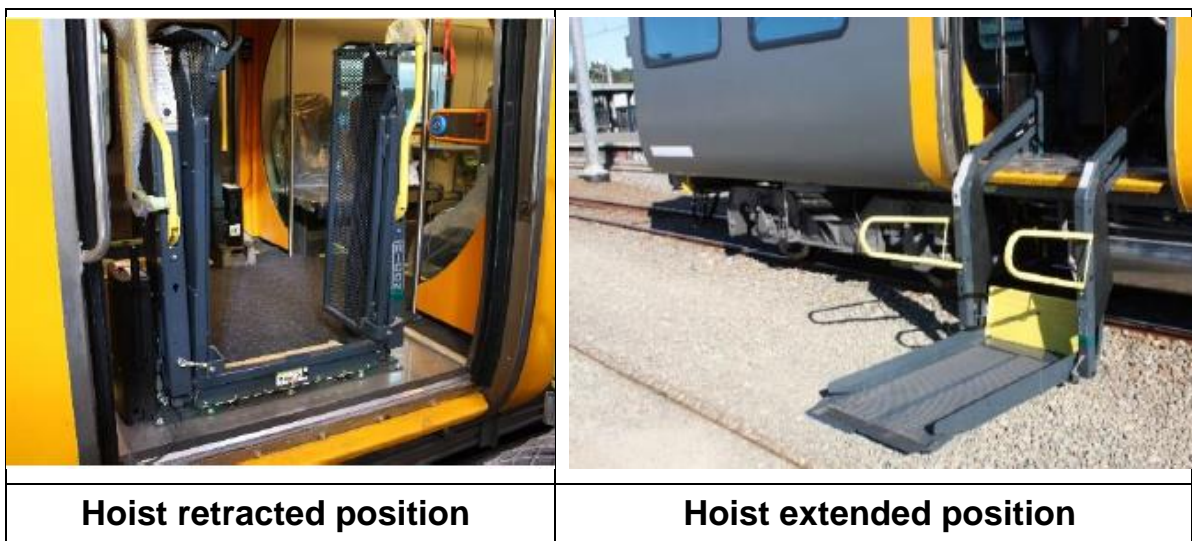
When the smoke alarm detects smoke, it triggers the alarm on the TMS and alerts are displayed in:

- the locomotive cab
- the TMS screen
- the switchboard, and
- the internal PID's

### 8.6 Wheelchair Hoist

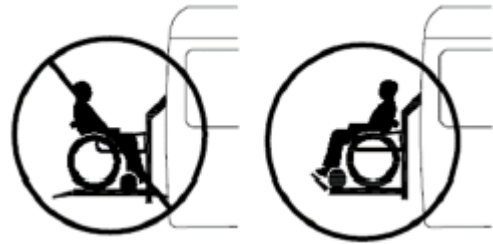
Wheelchair hoists are located in the SRC car (one each side of the car)

Hoists may only be operated by crew who have been trained in the operation







### 8.6.1 Safety precautions

1. Always load the wheelchair so that the person is facing outwards
2. When exiting vehicle, verify that the platform is at the same height as floor and front rollstop is up and locked.
3. Do not place equipment or luggage / boxes inside car that may prevent pivoting of the wheelchair.
4. Be certain wheelchair fits safely on platform; it must not extend beyond edges or interfere with the operation of rollstop.
5. The raised front rollstop prevents slow and unintentional rolling off the platform. It is not intended to stop a fast-moving wheelchair, which might tip forward if the small front wheels collide with the rollstop.
6. Keep arms, legs and clothing away from moving lift parts
7. Do not stand in front of lift while deploying the platform.
8. Lock wheelchair brakes before moving platform (power chair users should turn off power and set brake.)



### 8.6.2 Hoist functions

Icon	Term	Description
	Deploy	Hoist unfolds, or deploys, out of carriage from stowed position to floor level position.
	Down	Hoist lowers from carriage floor level towards ground level. The front rollstop automatically lowers (opens) when the hoist reaches ground level.
	Up	Hoist rises from ground level towards carriage floor level. The front rollstop automatically rises (closes) when the hoist leaves ground level.
	Stow	Hoist folds, or stows, from carriage floor level to the stowed position.

### 8.7 Wheelchair Locations

In the SRC, space is allocated for two wheelchairs, one wheelchair each side of the carriage.

The bench seat pushes up to allow access to the securing seat belt.

### 8.8 Train Management System (TMS)

The SR train has a TMS that monitors the safety critical systems.

Each carriage has a 'brain' which monitors all the devices in that carriage and communicates with the other vehicles on the train.

The TMS identifies any devices that are operating in an unsafe state and gives alerts to the Locomotive Engineer and / or Onboard crew.

TMS information is on display screens in each carriage and there is an hard wired intercom between Crew to Crew / Locomotive Engineer.

The 'ALARM OFF' button in the cab cancels the alert tone of an incoming call.



### 8.8.1 Systems monitored in carriages

TMS panels show the status and location of the following:

Item	Details
Battery	<ul style="list-style-type: none"> <li>• Low voltage warning</li> </ul>
CCTV	<ul style="list-style-type: none"> <li>• Camera fail</li> <li>• Hard drive fail</li> </ul>
Doors	<ul style="list-style-type: none"> <li>• Train Manager key switch – multiple key alert</li> <li>• Door isolated</li> <li>• Door open / closed</li> <li>• Magnetic lock locked or unlocked</li> <li>• Right of Way (RoW) or gong</li> </ul>
End of Train Safety	<ul style="list-style-type: none"> <li>• Electrical safety circuit not safe i.e. <ul style="list-style-type: none"> <li>○ Power cable or socket cap open</li> <li>○ TMS cable or air hose detached</li> <li>○ AAR jumper cable socket open</li> </ul> </li> </ul>
Heating, Ventilation and Air Conditioning (HVAC)	<ul style="list-style-type: none"> <li>• Duct Sensor to sense smoke</li> <li>• Status of Tunnel mode</li> <li>• Carriage Smoke detector NOTE: HVAC dampers close automatically on each unit when external smoke is detected</li> <li>• HVAC damper control <ul style="list-style-type: none"> <li>○ Recirculation</li> <li>○ Tunnel Mode</li> </ul> </li> <li>• Emergency Supply air fan turned on: <ul style="list-style-type: none"> <li>○ Emergency mode</li> <li>○ Running on emergency power</li> </ul> </li> </ul>
Passenger Emergency Brake	<ul style="list-style-type: none"> <li>• Activated</li> </ul>
Passenger Help call points	<ul style="list-style-type: none"> <li>• Activated</li> </ul>
Smoke Detector	<ul style="list-style-type: none"> <li>• Smoke detector activated</li> </ul>
Generator Status	<ul style="list-style-type: none"> <li>• Generator fire suppression</li> <li>• Generator running</li> </ul>

### 8.8.2 Systems monitored in locomotive

Item	Details
Airbag deflated	<ul style="list-style-type: none"> <li>Low voltage warning</li> </ul>
Smoke detector	<ul style="list-style-type: none"> <li>Smoke detector activated</li> </ul>
HVAC dampers	<ul style="list-style-type: none"> <li>Dampers closed</li> </ul>
Park Brake	<ul style="list-style-type: none"> <li>Applied</li> <li>Released</li> </ul>

### 8.8.3 Public Address broadcasts

For communications to the entire train

Step	Action
1.	Press the PA button
2.	Remove the handset from the cradle <ul style="list-style-type: none"> <li>The PA button will illuminate, and LCD will show 'PA in Progress' message</li> </ul>
3.	Hold the PTT orange button on the handset to make the PA announcement, release when finished talking. <ul style="list-style-type: none"> <li>PA announcement will be made in all cars</li> </ul>
When finished	
4.	Return handset to the cradle
5.	Press the PA button <ul style="list-style-type: none"> <li>The LED in the PA button will extinguish and the LCD will return to the default mode</li> </ul>

## For communications from Crew to Train Manager / SRC Café

Step	Action
1.	Press the CREW button
2.	Remove the handset from the cradle <ul style="list-style-type: none"> <li>• The CREW button will illuminate, and LCD will show 'crew call' activated message</li> <li>• PID will display 'TM to Office'</li> <li>• A buzzer will sound in the TMS panel in the Train Manager's Office and Café</li> </ul>
3.	To answer a Crew Call <ul style="list-style-type: none"> <li>• Remove the handset from the cradle</li> <li>• Press CREW button</li> <li>• The LCD will show 'crew call in progress'</li> <li>• Talk <u>without</u> pushing the PTT orange button on the handset</li> </ul>
When finished	
4.	Return handset to the cradle
5.	Press the CREW button <ul style="list-style-type: none"> <li>• The LED in the crew button will extinguish and the LCD will return to the default mode</li> </ul>

For communication to the Locomotive Engineer

NOTE: This feature does not function in the SRV cab

Step	Action
1.	Press the CAB button
2.	Remove the handset from the cradle <ul style="list-style-type: none"> <li>The CAB button will illuminate, and LCD will show 'Driver call' message</li> </ul>
3.	In the locomotive a buzzer will sound, and the CREW button will illuminate. LCD will show 'Driver call' message <ul style="list-style-type: none"> <li>Locomotive Engineers press the CREW button to acknowledge the call</li> <li>Remove handset from the cradle</li> <li>Communication between Crew and Locomotive Engineer can start</li> <li>Talk <u>without</u> pushing the PTT orange button on the handset</li> </ul>
When finished	
4.	Return handset to the cradle
5.	Press the CREW button <ul style="list-style-type: none"> <li>The LED in the CREW button will extinguish and the LCD will return to the default mode</li> </ul>

#### 8.8.4 Help Call Points

These are located:

- SR and SRV carriages
  - Opposite the door controls at each set of passenger doors, and
  - In the lavatory
- SRC carriages
  - Adjacent to the wheelchair tables,
  - In the lavatory, and
  - At the wheelchair hoist external dorrs on the inside and outside of the carriage.

Once a passenger holds the HELP call button for approx 5 seconds:

- A ding dong sound will be heard in all carriages
- The PEI buttons illuminates on the Teardrop and TMS panels

Once a HELP call button has been pressed it will stay illuminated to help crew find the call location.

Step	Action
1.	To answer a HELP call
2.	Remove the handset from the cradle and press the PEI button <ul style="list-style-type: none"> <li>• The LCD will show 'Help Call' message</li> </ul>
3.	Use the handset to speak to the help call location
When finished	
4.	Return handset to the cradle and press the PEI button
5.	Press the PA button <ul style="list-style-type: none"> <li>• The LCD in the PEI will extinguish and the LCD will return to the default mode</li> </ul>

## **9.0 SHUT DOWN PROCEDURES**

### **9.1 Connecting Electrical Shore Supply**

Shore supply allows a limited amount of power to the train to keep ancillary equipment such as chillers and freezers operating when the generator is shut down.

1. Confirm the generator is shut down, if not use the switch in the SRV cab to shut it down - switch the STOP / RUN switch to STOP.
2. At the generator control panel, turn the main selector switch to SHORE SUPPLY
3. At the shore supply point, connect the landline to the SRV external connection.
4. Switch on the external power supply.

### **9.2 Connecting Air Shore Supply**

1. Visually check the MR supply cock is closed.
2. On the carriage undo the dummy on the MR hose.
3. Couple the MR supply hose to the MR hose
4. Open the MR cock on the carriage.
5. Open the MR supply cock.
6. If the air supply is insufficient, adjust the regulator as required – check the gauge.

## 10.0 DIESEL ENGINE

The diesel generator located in the SRV supplies:

- Mains power for all electrical services
- Charges the battery back-up system in the train for; emergency lights, doors, toilets, PIDs, PA etc.
- Feeds main power in one direction, towards the number 1 end direction of all vehicles
- The power cable jumper socket is located on the B side at end 1
- The cab end of the SRV is not fitted with a jumper power cable socket

A fire in the generator will cause fire suppression system to shut the generator down, and the TMS will identify a fire.

## **11.0 AIR SYSTEM**

Reserved for future use

## **12.0 ELECTRICAL**

### **12.1 Electrical Cabinet Switch Board (230volt / 24 volt)**

All SR cars:

- Are powered from a diesel generator in the SRV carriage that provides mains power for all equipment in the carriages. Power is supplied between the carriages through a large power cable.
- If the train is parked overnight, the shore supply can be plugged in to supply limited power to keep items like freezers working.
- Each carriage has 24V battery back-up for safety critical system; operating doors; public address system; public information displays and toilets in the event of the generator stopping
- Emergency lights operate throughout the carriages and will come on automatically if the generator stops
- Each carriage is turned on individually/

#### **12.1.1 Battery Isolation Switch**

The battery isolation switch is located in the electrical cabinet on each car. This switch is used to turn the battery supply to the car's 24V circuits off.

#### **12.1.2 Circuit Breaker legend**

Inside each switchboard door is the legend of what the circuit breakers control

### 12.1.2 Carriage Lighting

The switch to turn the saloon lights on is located on the electrical cabinet. This switch turns on both the 24V emergency lights and the 230V AC carriage lighting.

The 230V AC lights will only operate when the generator is operating.



### 12.1.3 Emergency Lighting

The 24V emergency lights turn on automatically with the carriage lighting.

The batteries running these lights are constantly charged when the 230V system is operating.

## 13.0 BRAKES

### 13.1 Park Brake System

The “S” Ride bogies are fitted with a spring applied park brake on axle 2 and 3 (the inner axles) of each car.

The locomotive and SRV cabs are equipped with “Park Brake Apply” and “Park Brake Release” push buttons and a “Park Brake Applied” warning light, these controls allow the park brake to be applied and released from either cab. The “Park Brake Applied” light is on until every car has sufficient air in its park brake system to release its park brake.

The park brake can also be applied / released manually on each carriage by moving the park brake apply cock across the pipe (apply) or in-line with the pipe (release)

The 24 volt system must be on for the brake brakes to apply and release on the cars

The cab push buttons supply electrical pulses to the park brake shuttle valve on each car. This valve maintains the position it has moved to after the electrical pulse ceases.

The park brake can be isolated individually if a fault occurs with a particular park brake unit, or as a set if the train is to be towed dead.

#### 13.1.1 To Apply Park Brake

With the train in normal running condition i.e. all car circuit breakers turned on, the locomotive running, and main reservoir pressure normal:

- Push the “Park Brake Apply” push button firmly.

Air is exhausted from the spring park brake units, allowing a powerful spring inside each park brake unit to extend and apply the brake blocks against its wheels.

The “Park Brake Applied” light comes on as air is exhausted from the park brake units along the train.

### **13.1.2 To Release Park Brake**

With the train in normal running condition i.e. all car circuit breakers turned on, the locomotive running, and main reservoir pressure normal:

- Push the “Park Brake Release” push button firmly.

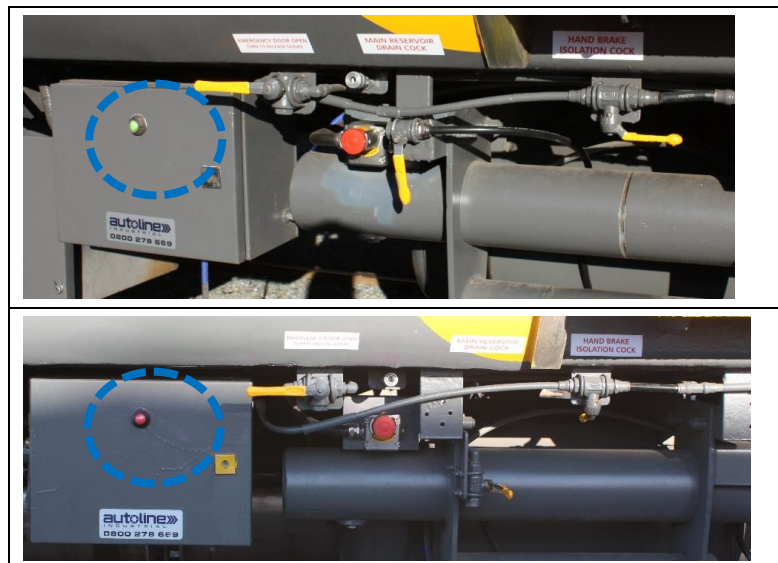
Air enters the spring park brake units, forcing the powerful spring inside each park brake unit to retract and release the brake blocks from the wheels.

The “Park Brake Applied” light goes out once air is in all the park brake units along the train and all the park brake units are in the release position.

### 13.1.3 Rotowink Indicator

With the independent brake on the locomotive fully applied and the automatic brake released:



- Apply or release the park brakes using the cab controls and have someone walk along the train, checking that the blocks are on the wheels of the inner wheelsets (if the park brake was applied) or off the wheels (if the park brake was released).
- A check also of the Rotowink (red / green eyeball) indicator on the control box on one side of each car will indicate whether or not the particular car shows the correct park brake status
  - When the Rotowink indicator is **Green**, the park brakes on the car have been commanded to release.
  - When the Rotowink indicator is **Red**, the park brakes on the car have been commanded to apply.
  - Think **RED** park brakes on **STOP**  
**GREEN** parks brakes off **GO**





## 13.2 Cut Out Air Brakes


### 13.2.1 Cut Out a Bogie


If brakes are dragging on a bogie, both the air brake and park brake must be cut-out and the park brake mechanically released.

Step	Action
<b>1.</b>	<b>Cut-Out the Air Brake</b>
1a	Locate the two brake cylinder isolation cocks on each side of the affected bogie. 
1b	Move the two cock handles from the in-service position to across the pipe
1c	Air should exhaust from the cylinder and brake blocks move away from the wheels
<b>2.</b>	<b>Cut-Out the Park Brake</b>
2a	Locate the park brake cut-out cock for the bogie 

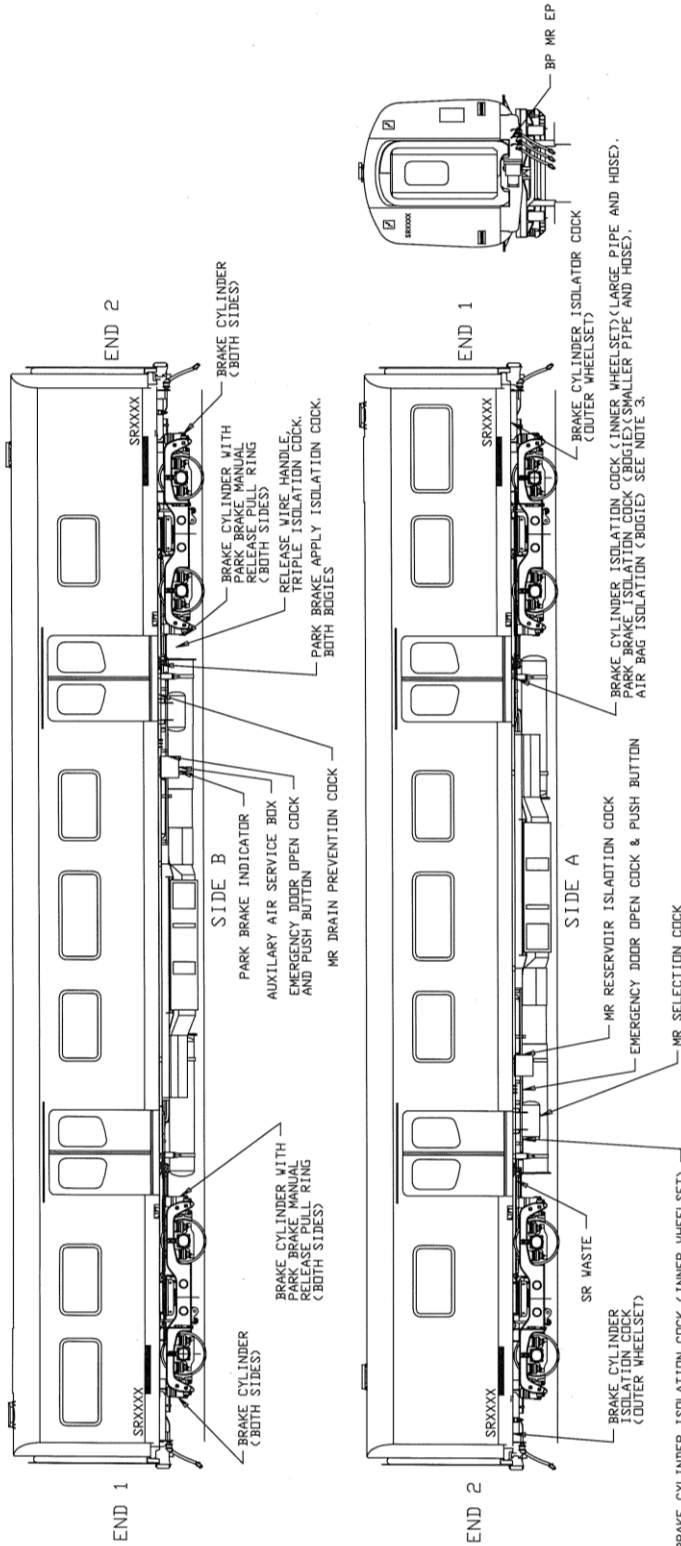
Step	Action
2b	Move the cock handle from the in-service position to across the pipe
2c	<p>Pull the ring on each park brake cylinder (two per bogie) on the inside axles for a minimum of 3 seconds until you hear the clunk</p> 
2d	<p>Complete an intermediate brake test on the carriage to confirm:</p> <ul style="list-style-type: none"> <li>• The bogie(s) with cut-out brakes do not apply</li> <li>• The other bogies, the brakes do apply</li> <li>• The next carriage, the brakes do apply</li> </ul>
2e	<p>Mark-up on the carriage BCO HB and date on both sides</p>  <p>Record carriage number and bogie cut-out in the 54D book and iPad</p>

**13.2.2 Cut-Out air brakes on whole carriage**

Step	Action
<b>1.</b>	<b>Air brake isolation by carriage</b>
1a	Locate the triple valve cut-out cock
1b	Move the cock handle from the in-service position to across the pipe – air should exhaust from the cylinder
1c	Pull bleed wire until all air has exhausted
1d	Bend the bleed wire over to hold the drain valve open
1e	Observe the brake blocks move away from the wheels
1f	Mark-up on the carriage BCO HB and date on both sides 

Step	Action - continued
<b>2.</b>	<b>Park Brake isolation by carriage</b>
2a	Locate the cut-out cock – look for label ‘park brake apply cock’ on the carriage body (close to triple valve) 
2b	Move the cock handle inwards from the in-service position to across the pipe
2c	Watch the Rotowink go from green to red
2d	Locate the cut-out cock – look for label ‘Main Reservoir Isolation cock’ on the carriage body (close to triple valve) This prevents the main reservoir from being drained.
2e	Break the cable tie and move the cock handle to across the pipe
2f	Pull the ring on each park brake cylinder (two per bogie) for a minimum of 3 seconds until you hear the clunk
<b>3.</b>	Complete an intermediate brake test on the carriage to confirm: <ul style="list-style-type: none"> <li>• The bogie(s) with cut-out brakes do not apply</li> <li>• The other bogies, the brakes do apply</li> </ul> The next carriage, the brakes do apply
<b>4.</b>	Record carriage number and brakes cut-out in the 54D book and iPad

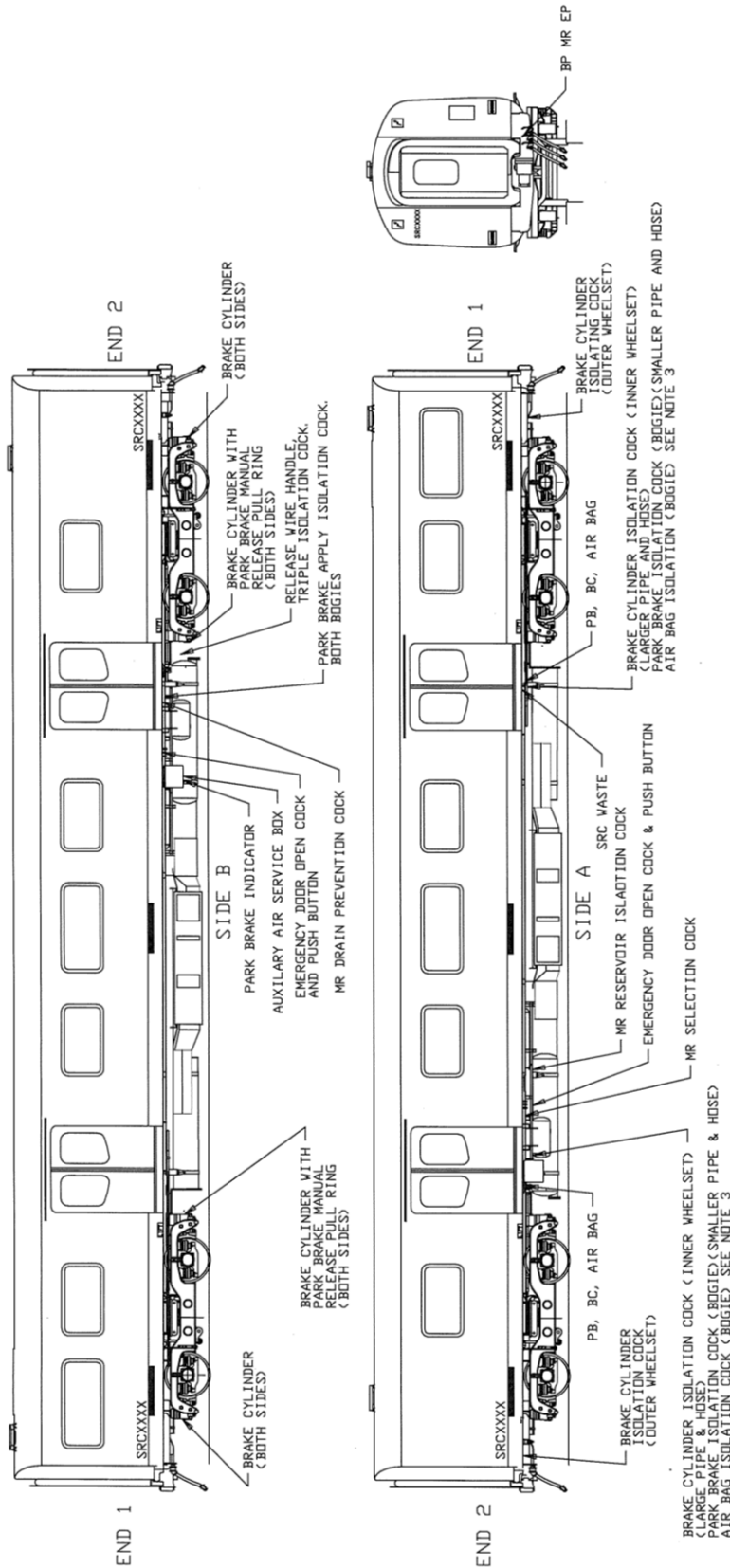
# 14.0 CUT OUT COCKS



SR cut out cock locations

NOTES  
 1. FOR DECALS SEE DRAWING 15040245.

- RULES FOR HANDLES POSITIONS
1. DOOR CONTROL HANDLES UNDER STEPS AND PARK BRAKE APPLY ISOLATION COCK BOTH BOGIES TO BE IN HORIZONTAL POSITION.
  2. ALL OTHER ISOLATION COCKS HANDLES TO BE VERTICAL IN NORMAL ON POSITION.
  3. THE AIR BAG ISLATION COCK IS SET BACK BEHIND THE BC & PB ISLATION COCKS.

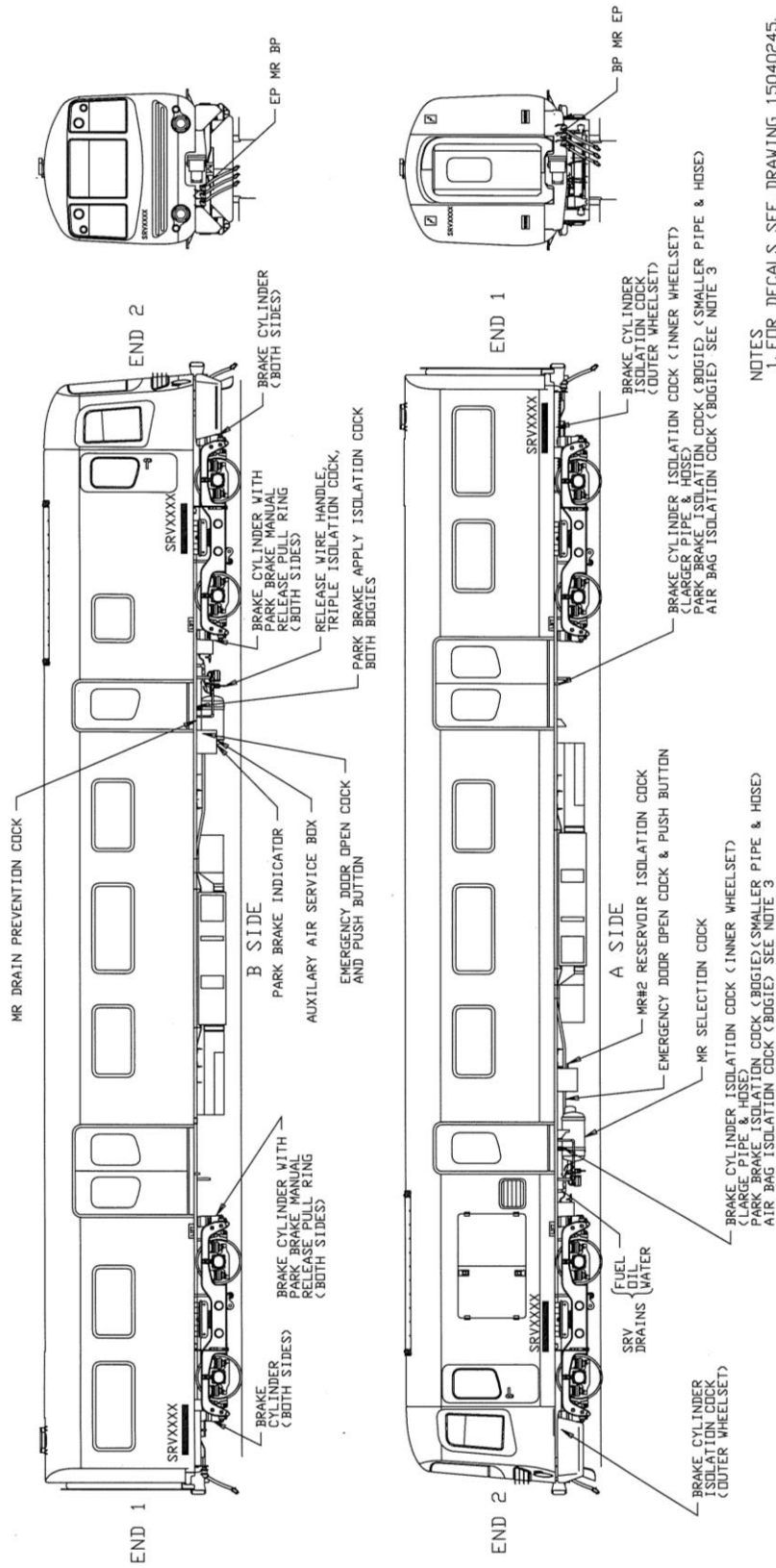


SRC cut out cock locations

NOTES  
1. FOR DECALS SEE DRAWING 15040245.

RULES FOR HANDLES POSITIONS

1. DOOR CONTROL HANDLES UNDER STEPS AND PARK BRAKE APPLY ISOLATION COCK BOTH BOGIES TO BE IN HORIZONTAL POSITION.
2. ALL OTHER ISOLATION COCKS HANDLES TO BE VERTICAL IN NORMAL ON POSITION.
3. THE AIR BAG ISOLATION COCK IS SET BACK BEHIND THE BC & PB ISOLATION COCKS.



SRV cut out cocks

- NOTES
1. FOR DECALS SEE DRAWING 15040245.
  1. DOOR CONTROL HANDLES UNDER STEPS AND PARK BRAKE APPLY ISOLATION COCK BOTH BOGIES TO BE IN HORIZONTAL POSITION.
  2. ALL OTHER ISOLATION COCK HANDLES TO BE VERTICAL IN NORMAL POSITION. THE AIR BAG ISOLATION COCK IS SET BACK BEHIND BC & PB ISOLATION COCKS.

## 14.1 For trains fitted with “S Ride” bogies

### 14.1.1 Main Reservoir Pipe and Brake Pipe (MR selection) Cock

This cock has three positions:

- Pointing inwards, Normal setting (Secured in this position)
- Pointing outwards, Main reservoir connected to the brake pipe
- Centered, Main reservoir is isolated.

### 14.1.2 Main Reservoir #1 to Main Reservoir #2 Isolation Cock

This is located on the side of the auxiliary air service box on the A side of the car.

- The #1 main reservoir provides air to the brakes.
- The #2 reservoir provides air to the doors and the air bags.

### 14.1.3 Triple Valve Isolation and Main Reservoir Drain Prevention Cock

These two cocks are used to isolate the entire braking system on a car.

The triple valve isolation cock is located next to the triple valve. The main reservoir drain prevention cock is located under the footstep of 2B door.

**NOTE:** The main reservoir prevention cock provides the air supply to the brake cylinders. For normal operation, this cock must be left in the open position.

### 14.1.4 Air Bag Isolation Cock

This cock is located on the A side of the car. There is one isolating cock for each bogie.

Use the Air Bag Isolation Cock to cut out the air supply to a bogie's air bag if its flexible hose to the bogie has failed or an airbag has burst.

### **14.1.5 Brake Cylinder Isolation Cock**

There are four Brake Cylinder Isolation Cocks provided on the A side of the car.

Each Brake Cylinder Isolation Cock isolates the pair of brake cylinders on an axle.

These cocks are vented, so that any air trapped in the brake cylinder is exhausted when the cock is turned to the isolate position.

### **14.1.6 Park Brake Isolation Cock (by bogie)**

Each bogie has its own park brake isolation cock, located on the A side of the car, near axles 2 and 3

Isolating this cock exhausts the air from the park brakes on its bogie and applies the park brake on this bogie.

These park brakes will not be able to be released from the cab. The Park Brake Applied light will NOT be on in the cab.

### **14.1.7 Park Brake Isolation Cock (by car)**

The Park Brake Isolation Cock for the entire car is located under the footstep of 2B door.

Isolating this cock exhausts the air from all the park brakes on the car to apply all the park brakes on this car.

These park brakes will not be able to be applied or released from the cab.

The Park Brake Applied light will be on in the cab.

## 15.0 EMERGENCY EQUIPMENT / OPERATION

### 15.1 Automatic Fire Suppression

The generator and its control panel are fitted with fire suppression.

The fire suppression system monitors the temperature above the engine using a thermal detection wire.

It is permanently 'live' and will operate without any interaction from the crew, but can be manually activated.

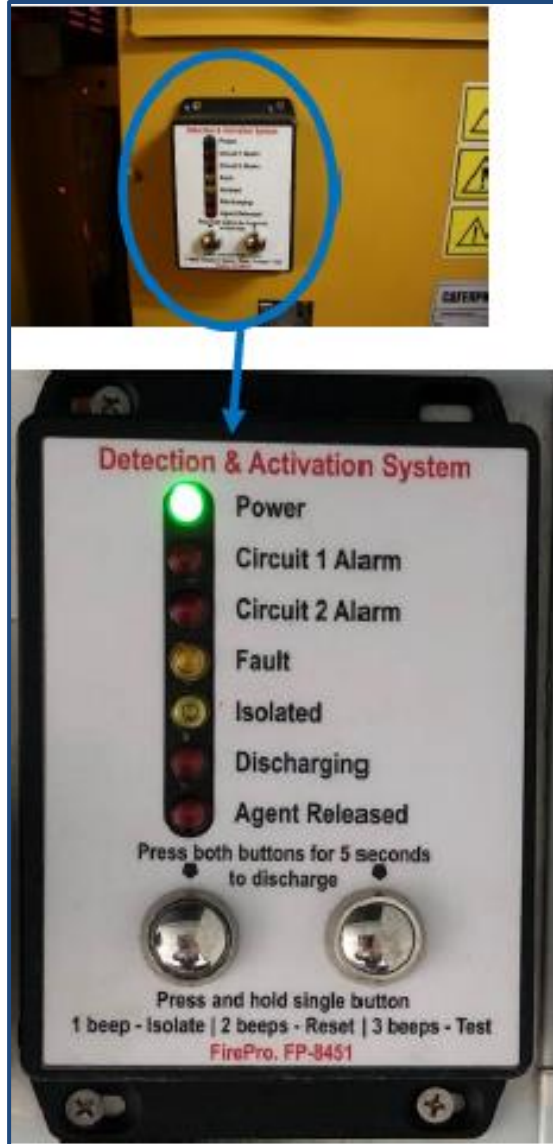
In the event of a fire in the generator or the SRV control panel, or the manual activation button is pressed.

- The control module immediately shuts down the generator and fans,
- The red alarm strobe is illuminated,
- The alarm buzzer sounds,
- The system shuts down the engine and ventilation fan and fills the engine bay with a fire suppressing agent.



### 15.1.1 Fire Control Indication Panel

The Fire Control Indication panel is located inside the generator housing.



The panel indicates the current system status, and can be used to manually activate the suppression system which will also stop the generator – Hold and press both buttons for 5 seconds to activate.

## 15.2 Emergency Escape in a Tunnel

In the event of an emergency within a confined area, for example cutting, bridge or tunnel, where it is not possible to evacuate passengers and crew from the train via the side doors, passengers and crew can be evacuated either through the centre windscreen of the SRV car, or from the end car and along the locomotive using the evacuation ladders provided.

### 15.2.1 To evacuate passengers and crew through SRV windscreen

To remove the emergency window

- Pull safety latches
- Rotate the 2 knobs (counterclockwise)
- Push window out from top

Using the escape ladder

- Ladder stored in the generator room
- Hook ladder over opening
- Evacuate passengers and crew when secure

### 15.2.2 To evacuate passengers / crew from end of SR car (next to locomotive)

- Unlock the inter-car door of the end SR car next to the locomotive
- Hook ladder over opening
- Evacuate passengers and crew when secure

### 15.2.3 Ladder Stowing

When stowing the ladder, ensure that the hooks are facing the saloon and not the cab.

### 15.3 Fire Extinguisher

A hand-held fire extinguisher is located in each SR car behind the seat and on the floor across the aisle from the electrical cabinet.

The SRV car has two hand-held fire extinguishers; one is located by the footrest in the cab, and the other is located by the inter-car door.

Fire extinguishers in passenger areas are fitted with a sealed lift-up cover. The seal is broken as the cover is lifted to access the fire extinguisher.

An audible alarm is fitted to the cover; this alarm sounds when the cover is lifted. The purpose of the alarm is to alert staff of improper use of the fire extinguisher by passengers. The alarm turns off when the cover is closed again.



## 15.4 Emergency Stop Button

Emergency Stop buttons are provided to stop the train in an emergency by signaling the Locomotive Engineer to apply the train brakes.

They are located on door control panels where there are a pair of co-acting doors.



When the Emergency Stop button is pushed, it will prevent the 'Train Closed' light from being illuminated.

An audible alarm will sound throughout the train and the TMS will guide the crew to the activated pushbutton.

The pushbutton can be reset by twisting the button anticlockwise in the direction of the arrow.

## **16.0 EVENT RECORDER / VIGILANCE**

Refer to Code Supplement for DFB locomotives for details of the Tranzlog event recorder and vigilance device fitted to the SRV cabs and DFB locomotives.

Information about Tranzlog and the Vigilance Device is contained in Rail Operating Code Section 4.1: Motive Power Unit Inspection and Operating Instructions: Instruction 7.1 and 7.2.

## 17.0 PROTECTIVE DEVICES

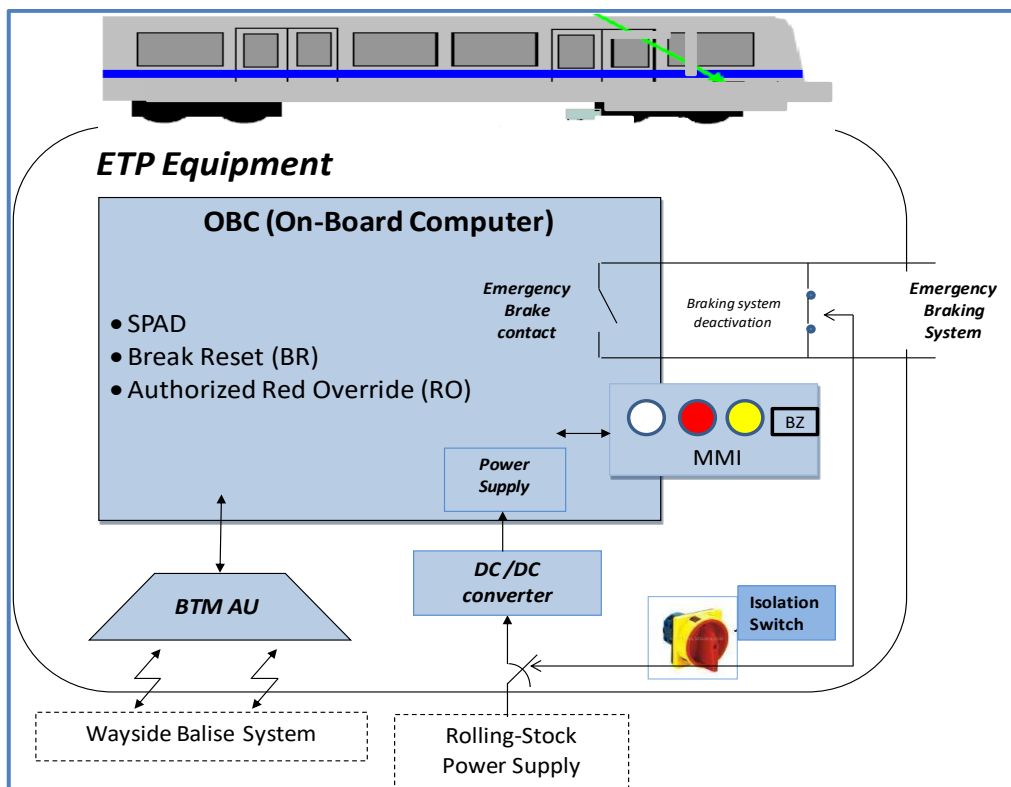
### 17.1 Electronic Train Protection (ETP)

The ETP is a Train Stop protection system designed to reduce the consequence of SPAD (Signal Passed at Danger – STOP) incidents. ETP is provided on all home, departure, directing and intermediate signals in the Papakura – Swanson (all lines inclusive) signalling area, plus the Papakura south back-shunt. The system consists of:

- 1 Main On-board computer (MAIN OBC Unit), located inside the rolling stock
- 1 BTM module (BTM AUX Unit), located inside the rolling stock
- 1 BTM Antenna Unit (AU)
- 1 DMI panel
- 1 DC / DC converter
- 1 Isolation Switch

The ETP system interfaces with the following devices / sub-systems:

- ETCS trackside balise system
- Emergency braking system
- Rolling stock power supply



### 17.1.1 Driver Machine Interface (DMI)

The main interface between the Machine (ETP) and the Operator is the Driver Machine Interface (DMI). The DMI installed in the operator's cab allows the operator to interact with it in a simple manner and have the status visible during normal operation. The operator must not interact with ETP while the train is moving.



The DMI panel consists of:

1. ETP Indicator (white display)
2. SPAD Pushbutton (indicator and button, red display)
3. AUTH Pushbutton (indicator and button, yellow display)
4. Buzzer (BZ)

### 17.1.2 ETP Functions and Operative Modes


The ETP equipment, through the DMI panel, will display information to operators allowing a set of actions. Each specific indication depends on a combination of ETP main functions and ETP operative modes:

ETP Main Functions are:

- Protection against Signal Passed at Danger – Stop (SPAD)
- Brake Reset
- Authorised Red Override


ETP Operative Modes are:

- Initialisation
- Supervision
- Isolation
- System Failures

 The ETP system does not protect the train against SPAD’s during setting back or shunting movements. Reverse or shunting movements are the responsibility of the operator as ETP will not be available under these conditions.

**17.1.3 Initialisation**

To enable ETP, the reverser must be in “Forward” or “Reverse” for SRV / DFB cabs. If the reverser is moved to “Centre” the ETP system will shut down. The ETP equipment runs trouble shooting tests each time ETP is enabled. Once the CPU returns positive results, the ETP equipment starts running. The initialisation process will last between 15 to 30 seconds and completion will be indicated by a flashing ETP light on the DMI.

 The operator must ensure that initialisation has completed before moving the unit. Failure to do so will result in Tranzlog applying the penalty brake once the vehicle has reached over 5 km/h which will require reset to move again.

During ETP initialisation the DMI will show the following status:





INITIALISATION			
			
<b>ETP Indicator</b>	<b>SPAD Pushbutton</b>	<b>AUTH Pushbutton</b>	<b>BUZZER</b>
Switched off	Switched off No action	Switched off No action	No sound

Fig.1

### 17.1.4 Supervision Mode

The normal mode for the ETP is in “Supervision” mode. Initially the ETP indicator will be flashing continuously until the first information from an ETCS trackside ballise group is received. Upon receiving the first information, the ETP indicator will turn to a steady white light.





SUPERVISION – after ETCS data received			
			
<b>ETP Indicator</b>	<b>SPAD Pushbutton</b>	<b>AUTH Pushbutton</b>	<b>BUZZER</b>
Steady white	Switched off No action	Switched off No action	No sound

Fig.2

The ETP system is now fully operational and performs the following functions:

- ETP decoding and detecting
- Application of emergency brakes if a SPAD occurs.

During the Supervision mode, no action is required by the operator.

### 17.1.5 Supervision Mode – Signal Passed at Danger – Stop (SPAD)

If a SPAD occurs, the SPAD pushbutton will display a flashing red light and the buzzer will sound continuously for 5 seconds. At the same time the ETP will apply the emergency brakes.




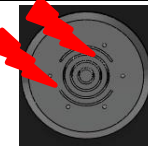
SUPERVISION – SPAD (Phase 1)			
			
<b>ETP Indicator</b>	<b>SPAD Pushbutton</b>	<b>AUTH Pushbutton</b>	<b>BUZZER</b>
Steady white	Blinking Red No action	Switched off No action	The buzzer sounds continuous for 5 seconds

Fig.3

After 5 seconds the buzzer stops and the SPAD pushbutton displays a steady red light.





<b>SUPERVISION – SPAD (Phase 2)</b>			
			
<b>ETP Indicator</b>	<b>SPAD Pushbutton</b>	<b>AUTH Pushbutton</b>	<b>BUZZER</b>
Steady white	Steady Red No action	Switched off No action	No sound

Fig.4

**Operator’s Action in case of Emergency Brake Application:**

- Stop the train as soon as possible. If not already, place the brake handle in the emergency position and / or activate the emergency stop button if not already done. Safeguard the train against unauthorised movement.
- Contact Train Control / Signaller to confirm incident.
- If a SPAD has occurred the train must not be moved. Wait arrival of Rail Incident Controller (RIC) at the scene. Follow instructions given by the RIC.
- If any other class of SPAD has occurred and the required authority from Train Control / Signaller has been received the ETP can be reset by pushing then releasing the SPAD pushbutton once after at least 2 seconds


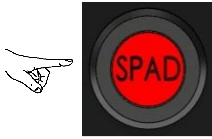


<b>SUPERVISION – Brake Reset (1)</b>			
			
<b>ETP Indicator</b>	<b>SPAD Pushbutton</b>	<b>AUTH Pushbutton</b>	<b>BUZZER</b>
Steady white	Steady Red To be pushed for at least 2 seconds then released	Switched off No action	No sound

Fig 5

The ETP DMI will return to the normal Supervision display when the ETP has been reset and that the brake function can be restored.



An emergency brake application instigated by ETP cannot be reset using the penalty brake reset button until 40 seconds has expired with ETP in operation. The operator must not attempt to reset either ETP or the penalty brakes while the train is still moving.

The procedure to recover from this is to:

1. Leave the selector in forward.
2. Press the SPAD pushbutton for at least 2 seconds then release
3. Wait for the ETP indicator light to turn on
4. Press the Penalty Brake Reset pushbutton after 47 seconds has elapsed
5. Proceed once the brake pipe has recharged

This procedure will ensure that Tranzlog sees that the ETP input is restored before a penalty brake reset is carried out – otherwise a reset will not occur.

#### **17.1.6 Supervision Mode - Authority received to Pass a Signal at All Red – STOP**

The ETP system allows overriding the application of the emergency brakes if a operator has received the necessary authority to pass a signal at All Red – STOP.

Additionally, utilising the authority button to pass signals at danger is required when an A light is displayed, or at any signal that Train Control is unable to act upon e.g. blacked out signals. Authority is not required on Low speed or R light indications as both these signals provide movement authority.

This function is enabled by pressing and holding the AUTH pushbutton for at least 2 seconds and releasing. The operator must follow all the existing rules for passing the relevant Signal at All Red - Stop at all times.



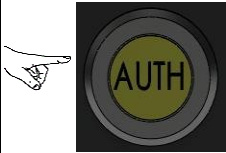

<b>SUPERVISION – ALL RED – STOP OVERRIDE (Phase 1)</b>			
			
<b>ETP Indicator</b>	<b>SPAD Pushbutton</b>	<b>AUTH Pushbutton</b>	<b>BUZZER</b>
Steady white	Switched off No action	Switched off To be pushed for at least 2 seconds and released	No sound

Fig 6

When the AUTH pushbutton is pushed for at least 2 seconds and released, it will display a steady yellow light while the ETP system maintains the override function for 45 seconds. If the front of the train has not passed the signal at All Red – Stop within 45 seconds, on expiration of the timer, the AUTH button must be pushed for at least 2 seconds and released to re-activate the override function. If this action is not followed the ETP may activate an emergency brake application as soon as the train passes the signal at All Red – Stop. Pressing the AUTH pushbutton during the 45 second timer will have no effect.




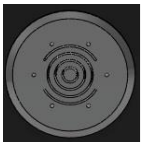
<b>SUPERVISION – ALL RED – STOP OVERRIDE (Phase 2)</b>			
			
<b>ETP Indicator</b>	<b>SPAD Pushbutton</b>	<b>AUTH Pushbutton</b>	<b>BUZZER</b>
Steady white	Switched off No action	Steady Yellow No action	No sound

Fig.7

If the ETP receives a trip order during the 45 seconds the AUTH pushbutton will flash 3 times and the buzzer will also sound 3 times. No action is required from the operator. Once the signal override is completed the DMI will return to normal Supervision mode.

**17.1.7 Isolation**

*The ETP Equipment can be manually isolated in case of malfunctions through a sealed, special switch located in the long hood (DC locos), short hood (DFT locos), and generator room (SD cars).*

*Any defects of the ETP system must be reported to Train Control, noted in the 54M book, and also reported in the FMP system.*

*After permanent isolation, the ETP provides no protection in terms of SPAD prevention, and the Operator is solely responsible for the safe running of the train.*

*Restrictions for operating with ETP isolated are included in Local Network Instructions and Section 17.1.9.*

*If ETP is not operational in the leading cab, e.g., a relief loco goes to the aid of a disabled train, ETP on the relief loco has to be isolated to prevent any accidental train trips. If the ETP equipment is isolated, the DMI will show the following status:*






ISOLATION			
			
<b>ETP Indicator</b>	<b>SPAD Pushbutton</b>	<b>AUTH Pushbutton</b>	<b>BUZZER</b>
Switched off	Switched off No action	Switched off No action	No sound

Fig.8

 The ETP system does not protect against SPAD's when in isolation mode. The train must be stationary whenever attempting to isolate the ETP. Failure to comply with this will cause an emergency brake application

Isolation Switches:



SRV Generator Room



DFB Locomotive On the cab panel with the vigilance penalty brake reset button

### 17.1.8 System Failures

The ETP equipment will enter a fail safe mode should the system detect an issue that affects safety occurs and the system is no longer able to fulfil its safety function. In this mode the ETP indicator keeps blinking and the buzzer sounds 5 times. In this mode the emergency brake contact is opened and if already in motion the brake will be applied. If stationary, should the operator move the vehicle, Tranzlog will apply the penalty brake when over 5 km/h.





SYSTEM ERROR DISPLAY - 1			
			
<b>ETP Indicator</b>	<b>SPAD Pushbutton</b>	<b>AUTH Pushbutton</b>	<b>BUZZER</b>
Blinking white	Steady Red (after 5 seconds. Illumination depends on initial fault)	Switched off No action	Buzzer sounds 5 times

Fig.9

In the event of this error the operator should undertake the following actions:

1. Ensure the vehicle is stopped before interacting with ETP equipment
2. If the SPAD pushbutton has illuminated, after 5 seconds of initial fault, press for at least 2 seconds **then release**. This will put ETP back into normal operation mode. Skip to step 4.
3. If the SPAD pushbutton is not illuminated, shut down ETP for at least 10 seconds using the cab controls (“Centre” reverser, or DMU to “Isolate”), or ETP Isolation switch and restart system.
4. If required, carry out a penalty brake reset following completing of the ETP initialisation sequence.
5. If the system restarts without an ETP alarm the unit may continue in service.
6. If the fault repeats after restart and is non-recoverable the ETP must be isolated and the train returned to depot in accordance with Train Control instructions.
7. In all cases ensure that the 54M fault log is annotated with a thorough description.

Points to note:

- If step 2 has been utilised to recover the fault, the DMI will display as per Fig.2
- If step 3 has been utilised to recover the fault, the DMI will display as if initialised.
- If the fault is recoverable the unit may stay in service, and the 54M must be annotated.
- If the fault is not recoverable the operator must inform Train Control and isolate the ETP system at the isolation switch.
- If the emergency brakes cannot be reset due to ETP malfunction, the ETP system must also be isolated.
- In all cases where the ETP has been isolated, Train Control must be notified and the defect noted in the 54M book.
- Once returned to a depot the train must be removed from service as per Train Control’s instructions.

**17.1.9 Operating Restrictions with ETP Isolated**

Different restrictions apply depending on where on the route the failure occurs and the ETP system is isolated.

*The following procedures must be applied in consultation with Train Control:*

<b>Location of Failure</b>	<b>Restrictions</b>
<p><i>Prior to service northbound: Te Rapa Depot to Frankton</i></p>	<p><i>The affected vehicle may not enter service if a working replacement is available.</i></p> <p><i>If a replacement is not available:</i></p> <p><b>North End ETP failed:</b> <i>The service may run to Papakura where customers must be de-trained and transferred to Metro rail or bus services.</i></p> <p><b>South End ETP failed:</b> <i>The service may run to Strand.</i></p> <p><i>The service must then be repositioned without passengers to Papakura and may wait for connecting passengers for the return journey.</i></p> <p><i>The Operator must:</i></p> <ul style="list-style-type: none"> <li>- <i>Take extra care when looking out and observing signals</i></li> <li>- <i>Must apply the Signal Alert function when passing signals at "caution".</i></li> <li>- <i>Not exceed Restricted Speed</i></li> </ul>

<b>Location of Failure</b>	<b>Restrictions</b>
<p><i>In service northbound: Frankton to Papakura</i></p>	<p><i>The service may run to Papakura where customers must be de-trained and transferred to Metro rail or bus services.</i></p> <p><i>If ETP <b>is</b> functioning in the rear cab, the train may be repositioned to the Strand. The Operator must:</i></p> <ul style="list-style-type: none"> <li><i>- Take extra care when looking out and observing signals</i></li> <li><i>- Must apply the Signal Alert function when passing signals at "caution".</i></li> <li><i>- Not exceed Restricted Speed</i></li> </ul> <p><i>If ETP <b>is not</b> functioning in the rear cab the train must not proceed beyond Papakura. The train may remain at Papakura and wait for connecting passengers for the return journey.</i></p>
<p><i>In service northbound: Papakura to The Strand</i></p>	<p><i>Customers must be de-trained at the first available platform and be transferred to Metro rail or bus services.</i></p> <p><i>If ETP <b>is</b> functioning in the rear cab the train may be repositioned to the Strand for the return journey.</i></p> <p><i>If ETP <b>is not</b> functioning in the rear cab, the train must be returned to Papakura, as arranged by Train Control, and may wait for connecting passengers for the return journey.</i></p> <p><i>During all movements without ETP operating the Operator must:</i></p> <ul style="list-style-type: none"> <li><i>- Take extra care when looking out and observing signals</i></li> <li><i>- Must apply the Signal Alert function when passing signals at "caution".</i></li> <li><i>- Not exceed Restricted Speed</i></li> </ul>

<b>Location of Failure</b>	<b>Restrictions</b>
<i>In service southbound: The Strand to Papakura</i>	<p><i>Customers must be de-trained at the first available platform and be transferred to Metro rail or bus services.</i></p> <p><i>The train must continue to Papakura, as arranged by Train Control, and may wait for connecting passengers for the remainder of the journey.</i></p> <p><i>During all movements without ETP operating, the Operator must:</i></p> <ul style="list-style-type: none"> <li><i>- Take extra care when looking out and observing signals</i></li> <li><i>- Must apply the Signal Alert function when passing signals at "caution".</i></li> <li><i>- Not exceed Restricted Speed</i></li> </ul> <p><i>Once south of Papakura and clear of the Auckland Electrified Area, the above restrictions may be lifted. The vehicle may continue in normal service to Frankton Station and must then be removed from service for repair.</i></p>
<i>In service southbound: Papakura to Frankton</i>	<i>The vehicle may continue in normal service to Frankton Station and must then be removed from service for repair</i>

***Detraining Passengers within Metro Territory – Special Circumstances:***

*Should special circumstances exist then the Network Control Manager may exercise discretion in authorising running to an alternate, more suitable station.*

*Circumstances include:*

- Exceptional weather conditions*
- Adequate access for alternative road transport*
- Suitable platform to safely de-train customers*

*Passengers may remain on the stationary train if circumstances dictate until suitable arrangements have been made.*

## 18.0 SAFETY INSTRUCTIONS

If the trailing locomotive is placed into Trail 26 the brakes on the locomotive will not respond to an automatic brake application, so it is critical that Trail 24 is used. See Instruction 8.10

**NOTE:** The Independent brake handle will still control the locomotive brakes if the locomotive is unintentionally put into the Trail 26 position.

SR car brakes are Graduated Release, which is not compatible with direct release brake systems, hence brakes on SR cars must be isolated if on other Freight or Passenger Services. If this instruction is not followed, the consequence is dragged brakes.

The Main Reservoir Pipe must be connected through each car to provide air to brake cylinders and the doors, unless the train is set up for single pipe operation. See Section 8.10. If this instruction is not followed, the consequence is no brakes.

### 18.1 Safety Equipment

The SR carriages are fitted with:

Equipment	Location
Built in tail lights	Two at each end of each carriage
CCTV	Ceiling mounted in each carriage
Cycles / pram area with securing belts	In the SRV
Emergency door release switches (four)	One at each door control panel
Emergency exit ladder	In the SRV generator room
Emergency lighting	Ceiling mounted in all carriages
External emergency door release buttons (red)	One each side of the carriage under frame by each set of doors
First aid kit	In the SRC café area
Fire extinguishers (two)	One at each end of the carriage floor mounted

<b>Equipment</b>	<b>Location</b>
Floor mounted glow in the dark strips	<ul style="list-style-type: none"> <li>• One along the length of the central walkway</li> <li>• Two (one each side) at the location of the external doors</li> </ul>
Portable headlamp for shunt movements	Bracket on the number 1 end A side
Hearing aid loops	In the floor of each carriage and a local one at the café counter
Park brakes	Axle mounted two on each inside axle
Passenger Emergency Brake (PEB) applied warning light	Switchboard and the TMS
Passenger Emergency Brake (PEB) push button	At least two in each carriage
Passenger help button	At least four in each carriage
Passenger Information displays (PID)	Ceiling mounted at each end of the carriage (two), outside facing (two)
Portable radio – Train Control and Locomotive Engineer channels	SRV office
Portable radio – ASP channels	SRV Generator room
Smoke detectors	Ceiling mounted in each carriage
Train Monitoring System (TMS)	In each carriage and Information screen, in the Train Manager's office, café counter and locomotive
Wheel chocks (two)	In the SRV generator room in a red equipment bin / or the SRV cab floor
Wheelchair positions (two) with securing belts	In the SRC

## 18.2 Antenna Hazard

During operation of ETP, the antenna which is mounted on the underneath of the operational vehicle constitutes a radio frequency hazard. As a result the following should be adhered to at all times:

**HAZARD: With ETP operational it is mandatory to maintain a minimum distance of 1 metre from the antenna.**

For the purpose of safety, one of the following steps should be carried out on the ETP system to ensure that the antenna is not live when under frame access is required:

- Vehicle should be left in the neutral / isolate position and not forward, reverse or start.
- Isolate via the ETP circuit breaker or isolation switch

## **19.0 MISCELLANEOUS**

### **19.1 Seats and Tables**

SR carriages have fixed seats and tables in various configurations.

Most seats have:

- Floor level wall mounted twin power points, and
- Two USB sockets between the seat squabs

#### **19.1.1 Bicycles and Prams**

In the SRV, space is allocated for carrying bicycles or prams. The seats are secured up by straps, and seat belt type fasteners are provided for the cyclists to secure their cycles.

There is room for two bicycles on each side, four in total.

### **19.2 Air Conditioning System**

Each SR carriage is fitted with a CoolZone Heating Ventilation, and Air Conditioning (HVAC) with its own controls. Sensors in the carriage allow the system to regulate the temperature automatically.

Each carriage HVAC system operates separately. The controls are in the switch board at the B end No.2 side.

The air conditioning units are operated using the 'KN' key.



Control	Function
HVAC On / Off	When turned on a green light is illuminated
Temperature	There are four temperature settings. Two blue is coolest and two red is hottest
Recirculation	Used when the system fails, or when travelling through a tunnel
Cooling failure Light	When illuminated and cold outside – do nothing as the system will still provide heating. When illuminated and hot outside – turn the recirculation switch to ‘Cooling Failure’ <ul style="list-style-type: none"> <li>• The system will open dampers to let in more fresh air</li> <li>• The air will not be cooled</li> </ul> The light will remain illuminated while in this mode
Filter Change Light	When illuminated, record in the 54D book and iPad, the carriage number and that the filter light is illuminated
System Fault Light	Indicates the heating / cooling part of the air conditioning unit has ceased to function but the supply fan should be running

### 19.2.1 Normal Operation

For normal operation:

- The recirculation switch is set to 'NORMAL', and
- The HVAC switch is set to 'ON'
- The temperature switch can be set to one of four positions to give a four degree celsius variation in the carriage temperature. The coldest setting has two blue dots, with one blue dot, then one red dot and then two red dots providing progressively the warmer settings.

### 19.2.2 Faults

If...	Then...
If the "Fault" indicator is illuminated:	The heating / cooling part of the air conditioning unit has ceased to function but the supply fan should be running.
If the "Cooling Failure" light is illuminated and it is cold outside:	Do nothing with the controls as the system will still provide heating.
If the "Cooling Failure" light is illuminated and it is hot outside:	Turn the recirculation switch to "Cooling Failure", the system will open dampers to let in more fresh air but the air will not be cooled. The "amber" light will remain on while in this mode. In all but the hottest conditions, this should allow a journey or roster to be
Filter Indicator illuminated	Record in the 54D fault book / iPad the carriage number

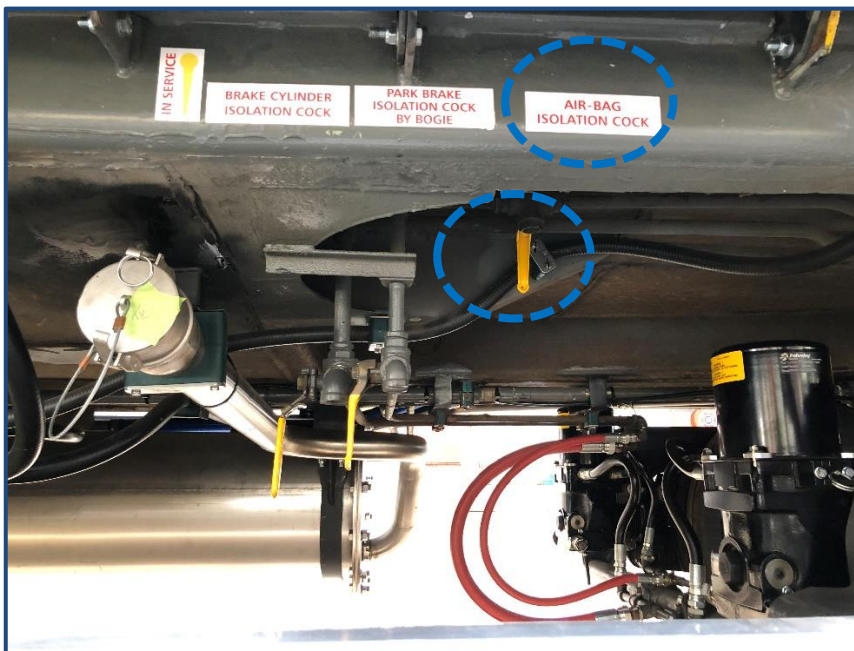
## 19.3 Air Bag System

Carriage suspension uses air bags instead of springs and hydraulic dampers.

The airbag system is designed so that:

- When operating normally, the airbags support the carriage weight and provide damping for the suspension system.
- If one airbag deflates, the opposite bag will deflate to prevent car leaning.
- If there is insufficient air in any airbag due to a problem with the air supply or a leak develops, the “Air Bag Deflated” warning light comes on and TMS audible alarm will sound

**NOTE:** The air bag isolation cocks can be found on the A-side of the car under each door are are labelled on the carriage body as shown below.



### 19.3.1 Air Bag deflation

Step	Action	
1.	<b>If...</b>	<b>Then</b>
	1. Train is moving 2. Yellow airbag deflated light illuminates 3. Warning tone heard	<ul style="list-style-type: none"> <li>• Slow the train immediately</li> <li>• Contact the Train Manager, if unable to make contact, <b>stop</b> the train</li> </ul>
2.	<b>If...</b>	<b>Then</b>
	If speed is above 52 km/h	Tranzlog audible alarm will sound with a solid tone to indicate a read overspeed condition
	If speed is below 48 km/h	Tranzlog audible alarm will stop
	If no action is taken to apply the brakes	The overspeed condition will apply penalty brake after 10 seconds
	If the train brake is applied during the 10 second alarm period to slow sown the train	The penalty brake application will be supressed
3.	Stop the train at a location where both sides of the train can be safety inspected. If the issue is not fixable, the bogie with the damaged / deflated airbags must have the airbags cut out. Leave the opposite side inflated. Shut off the airbag isolating cock to stop the air supply to the airbags of that bogie.	
	<div style="border: 1px solid black; padding: 5px;">                         NOTE: If this is not done, pressure may continue to be lost via the ruptured airbag.                     </div>	
4.	Travel to destination, maximum speed 50 km/h	

## 20.0 DOOR OPERATION

### 20.1 General Description

All car doors are electrically controlled and air operated. The doors are monitored are part of the train closed / train safe system.

- The two doors at each opening operate as a pair
- The control panels are on the inside at each door.
- Passenger push buttons are on the inside and outside of the carriage.
- Each control panel has an emergency release switch.
- Emergency access cocks are under the carriage at the number 2 end doors.
- The obstacle detection system at a door is designed to provide a brief door open / close sequence should there be an obstruction as the door closes.

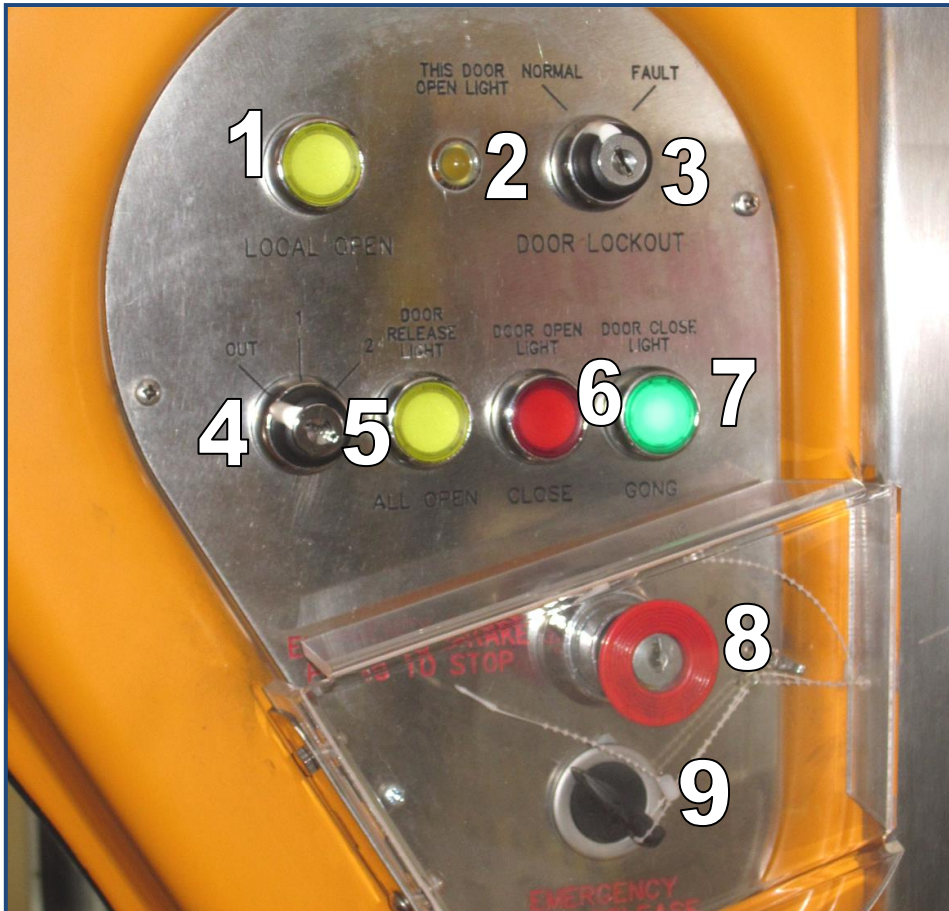
All doors are provided with door open and door closed lights:

- To achieve a door closed light throughout the train and in the cab, all doors must be closed.  
If one or more doors are open, the door open lights are on at the open door control panel and exterior above the door and in the cab.
- The carriage doors on a side cannot be opened by the Train Manager until after the Locomotive Engineer gives permission for the door release.
- A local door at which the Train Manager has taken control can be opened without a door release being obtained from the Locomotive Engineer.

**NOTE:** the Locomotive Engineer cannot get traction power when the passenger doors are either open, or a release has been given to the Train Manager

## 20.2 Saloon Door Controls and Indicator Lights



The door control panel:



The items highlighted in **bold** below are the controls and indicator lights that are used for routine door operation.

<b>1.</b>	<b>Local Open Push Button:</b>	Pressed to open this (local) saloon door only.
<b>2.</b>	<b>“This Door Open” Light:</b>	This light is on when this (local) saloon door is open.
<b>3.</b>	<b>Door Lockout Switch:</b>	Usually in the “NORMAL” position This door will not open when the switch is in the “FAULT” position.

Saloon Door Controls and Indicator Lights continued:

<p><b>4.</b></p>	<p><b>Door Key Switch:</b></p>	<p>Enables the controls on this door panel to be used when the switch is in position “1” or position “2”.</p> <p>These controls are the “Local Open”, “All Open”, “Doors Close” and “Gong” push buttons.</p> <p>When the key switch is in the “OUT” position, the controls on the door panel cannot be used</p>
<p><b>5.</b></p>	<p><b>All Open Push Button:</b> <b>“Doors Released” Light:</b></p>	<p>Pressed to open all the doors on that side.</p> <p>The light comes on when the Locomotive Engineer has “released” the doors.</p>
<p><b>6.</b></p>	<p><b>Close Push Button:</b> <b>“Door Open” Light:</b></p>	<p>Pressed to close all the doors on a side.</p> <p>This light indicates that a door is or doors are open along the train.</p>
<p><b>7.</b></p>	<p><b>Gong Push Button:</b> <b>“Doors Closed” Light:</b></p>	<p>Pressed to signal the Locomotive Engineer.</p> <p>This light indicates that all the doors are closed along the train</p>
<p><b>8.</b></p>	<p>Emergency Brake Push Button</p>	<p>This push button is not a part of the door controls – refer to section 5.2.7</p>
<p><b>9.</b></p>	<p>Emergency Door Release Switch</p>	<p>Normally in the “ON” position to supply air to the door rams.</p> <p>The switch is turned clockwise  to release air from the door ram so that the door can be opened by hand.</p> <p>The switch is in the normal (auto) position when the switch pointer is to the left of upwards (in the 10 o’clock position) </p>

### 20.3 Locomotive Door Controls and Indicator Lights



The picture is of the cab door controls and indicator lights on an SRV car. The arrangement and functions are the same on DFB locomotives fitted with door controls and indicator lights.

1.	<b>PEB Override latching Push Button/Light:</b>	This push button is used by the LE to override activation of the passenger emergency brake until the train is in a safe stopping location. A light in the push button indicates that it is latched in the closed position.
2.	<b>Alarm Silence latching push button</b>	This push button is used to silence the audible alarm as necessary
3.	<b>Door Release Push Button and Light:</b>	This push button is pressed to “release” the doors. The “Door Release” light turns on when this is done and the “Doors Released” lights turn on at all door control panels.
4.	<b>“Doors Closed” Light:</b>	This light indicates that all the doors are closed along the train.  This light is on when the “Doors Closed” lights are on at all door control panels and the gong button for right of way has been pressed at one of the carriage door control panels.

## 20.4 Routine Door Operating Procedures

### 20.4.1 Door Release

The Locomotive Engineer is responsible for ensuring that the train has stopped at a station with all saloon doors on the platform at a station before pressing the “Door Release” push button.

When the Locomotive Engineer presses the “Door Release” push button:

- The “Door Release” light illuminates on the “Door Release” push button in the cab.
- The “Doors Released” lights are on at all door stations along the train

The “Door Release” push button will only function when certain conditions are met. These conditions vary depending on the vehicle type:

- When the locomotive brake cylinder pressure is above 110 kPa, or the brake pipe pressure is below 475 kPa.

### 20.4.2 Opening all the Doors on a Side

**NOTE:** If the train is running on the opposite main to normal, the Train Manager must make sure that they open the doors on the correct platform side.

The Train Manager must observe that the “Doors Released” light is on before inserting the door control key in the key switch and turning the switch to position “2”.

**NOTE:** Never put your key into the key switch until the train comes to a complete stop.

The Train Manager then presses the “All Open” push button.

- The saloon doors on this side open.
- The “Doors Closed” lights go out and the “Door Open” lights come on as the doors open.

**NOTE:**

The key can be removed from the key switch at this point if desired by turning the key to the OUT position and extracting it e.g. at terminal stations. The doors that have been opened will stay open.

If the Train Manager leaves their door (e.g. to assist someone at a different door, or at a terminal station while all doors are open), the key must be removed from the key switch.

The Train Manager steps out on the platform to allow them to have a clear view of the doors.

### 20.4.3 All Doors Close and “Right Away”

- The Train Manager ensures that all passengers are clear of the doors by checking in both directions.
- The Train Manager presses the CLOSE push button.
- The “Doors Closing” alarms sound and the doors start to close except the local door which is held open with the key switch in position “2”
- Leaving the key in position “2”, the Train Manager walks out onto the platform from the local door to check that all doors have closed properly.
- The Train Manager checks that the “Doors Closed” lights on the door control panel is ON, confirming that all doors except the local door have closed
- The Train Manager turns the key switch to position “1” to close the local door

The Train Manager must check that the “Doors Closed” light is still “ON” before pressing the “Gong” push button twice to give the “Right Away” signal to the Locomotive Engineer.

- The “Doors Released” light goes out as the “Gong” push button is pressed.

**NOTE:** If an ALL OPEN pushbutton is pressed at a station, the CLOSE pushbutton must be pressed before leaving the station or it will not be possible to obtain “Door Closed” lights.

#### 20.4.4 Moving off from the station

The **Locomotive Engineer** must wait until the “Right Away” signal is received, and check that the “Doors Closed” light is on, before moving the train away from the platform.

**NOTES:** The key must be removed from the key switch on the door control panel if the door is left unattended because:

- The door indication circuit at the local door is bridged out when the key switch is in position “1” or “2”.
- The gong push button and the local open push button can be operated at any time with the key switch in position “1” or “2”.

#### 20.4.5 Local Open

The Train Manager can open the local door if desired e.g. if there are few or no passengers on board or the Train Manager wishes to vet those about to board.

**NOTE:** The train must be stationary before a door is locally opened. The “Door Open” lights come on when the Local Open Push Button is pressed. The “Door Open” alarm(s) will sound if the vehicle is moving.

A “Doors Released” light is not required before the local door can be opened.

- 1) Insert the key and turn the key switch to position “2”
- 2) Press the “Local Open” push button.

The “Door Open” lights come on the instant the push button is pressed. The local door opens.

- 3) Once the local door has been opened, the following actions are possible:
  - Press the “Close” push button to close the local door.  
The “Doors Closed” lights come on the instant the “Close” push button is pressed.
  - OR if the “Doors Released” light is on and all doors on that side are to be opened:  
Press the “All Open” push button to open all the doors on that side.  
The doors are then closed as per “20.4.3: All Doors Close” above.

### 20.4.6 Car Door Operation

A “Door Operation” switch is provided on a car to enable saloon doors on the car to be turned off to prevent passengers from boarding the car.

The doors on other cars in the train will still open and close normally.

While a Door Operation switch is in the OFF position, the door control system that this switch is a part of still receives and retains the door commands given from other cars. When the Door Operation switch is turned back to ON, the doors controlled by this switch will align with the doors on the other cars.

**NOTE:** DO NOT turn a Door Operation switch to “ON” when the train is moving: the doors on one or both sides of the car may open.

Should a car miss a Close command, the door system on the car will still be primed to open the doors on a side – turning the Door Operation switch on will cause the doors on that side to open at once.

The Door Operation switch can be safely turned to OFF when the train is moving.

The Door Operation switch is on the electrical cabinet of each car. Each switch controls the doors of its own car.

### 20.4.7 Door Control Panel Indications

<b>“Doors Closed” lights</b>	On the console and each door control panel. These lights indicate that all saloon doors are closed. These are green lights (except in the cab, which has a blue “Door Closed” light).
<b>“Door Open” lights</b>	Are on at all door control panels and in the cab if one or more saloon doors on the train are open
<b>“This Door Open” light (internal)</b>	Is provided at each saloon door control panel The light is on if this door is open. This light is useful in determining the door that is still open and is preventing the “Doors Closed” lights from being on.
<b>“This Door Open” light (external)</b>	Is provided above the saloon door outside the car This is useful, at night in particular, to indicate a door that has not closed properly.
<b>“Door Open” Alarm</b>	Will sound if an attempt is made to move the train with “Door Open” lights still on or of the “Door Open” lights come on while the train is moving

**NOTE:** The Train Manager is to alert the Locomotive Engineer to stop the train if the train moves from a station or is travelling between stations with the “Door Open” lights on and the Locomotive Engineer does not immediately stop the train.

Operate the emergency brake, if necessary.

### 20.4.8 Obstacle Detection

Obstacle detection is active when a saloon door is closing.

If a person obstructs a door while it is closing, the door will automatically open for a few seconds and then close again.

The door will repeat this sequence until the obstruction is removed.

When the obstacle is removed and the door shuts, the obstacle detection system is rendered inactive and remains inactive until the door is opened again.

### 20.4.9 Gong (bell) Codes

The following codes are provided to enable the Train Manager to communicate with the Locomotive Engineer:

<b>Two gongs</b>	Proceed (Train Manager aboard)
<b>Three gongs (given quickly)</b>	Stop
<b>Six gongs</b>	Fire on board
<b>Continuous gongs</b>	Release the doors

### 20.4.10 Emergency Door Release

Step	Action	
1.	<b>If...</b>	<b>Then</b>
	The train is stopped and independent brakes are fully applied. The door release button does not release the doors	Press the emergency door release button This button and the door release button will illuminate with a white light
2.	After passenger work is complete and the Train Manager closes the doors and gong's 'Right of Way' a tone is heard	
3.	Press the emergency door release button to cancel the light	

### 20.4.11 Door Light extinguishes in cab while train moving

Potentially the passenger doors are open.

If...	Then
1. Train moving 2. Blue door light extinguishes 3. Warning tone heard	<ul style="list-style-type: none"> <li>• Slow the train immediately</li> <li>• Contact the Train Manager, if unable to make contact, <b>stop</b> the train.</li> </ul>

Once the train has stopped, the Train Manager will inspect the doors and report back to the Locomotive Engineer.

### 20.4.12 Internal Doors

A glass automatic sliding door is at the end of each carriage to create a barrier for noise and dust between the seated area and the internal inter-carriage doors.

The internal doors automatically:

- Open by a person passing through a beam located at the top of the door
- After a person has passed through the sensor range, the door will close in 3 seconds

The doors may also be opened or closed using the ‘open / close’ pushbutton on the wall beside the door.

To allow for emergency egress if the 24V power fails, the doors can be pushed open and will stay open until power is restored. The doors can also be disabled by moving the switch to the relevant position.



## 20.5 Isolate defective pair of doors

A door isolation switch is provided at each door station.

This switch is used to:

- Stop the door from opening because the door is faulty e.g. it will not shut, it will not open, it sticks, or the door repeatedly opens and closes
- Stop the door from opening if it is dangerous for passengers to alight at this door e.g. if the train has overrun a platform

## 20.6 Isolate all doors in a carriage

A door control switch is provided on the electrical cabinet of each carriage.

Each switch controls the doors on that carriage and is used to electrically isolate all doors from opening in that carriage.

This switch is provided to enable all external doors on the carriage to be turned off to prevent passengers from boarding the carriage.

The doors on other carriages will still operate normally



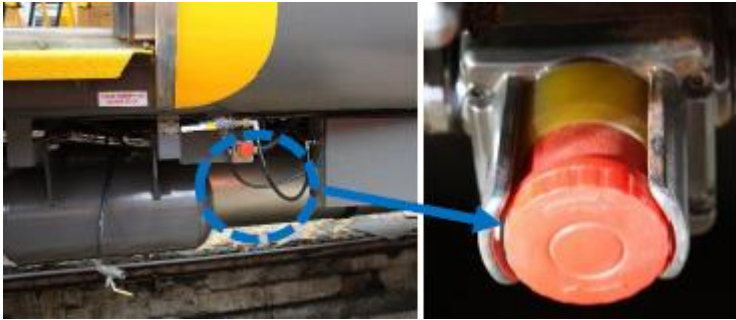
## 20.7 Emergency Door Operating Procedures

A manual emergency door release system is provided on the inside and outside of the carriages.

This allows the safety systems to be overridden and the door to be opened in an emergency.

This switch is only to be used if a person must be extracted from a closed door or if passengers have to be evacuated from the train. It is assumed that the saloon door cannot be opened in the normal manner.

**NOTE:** The emergency door release switch IS NOT to be used to isolate a faulty door. With no air on the door, the door is able to “float” and may drift open of its own accord or when a passenger leans on it.

<b>Carriage Type</b>	<b>Internal Emergency Door Release Switch</b>
SR, SRC	On all door control panels
SRV	Only on the double door control panel
	
<b>Carriage Type</b>	<b>External Emergency Door Air Valve</b>
SR, SRC, SRV	Under the side doors at the No.2 end of the carriage – both sides
	
<b>Carriage Type</b>	<b>External Emergency Door Release Button</b>
SR, SRC, SRV	On the frame close to the side doors
	

## 21.0 PASSENGER INFORMATION DISPLAY (PID)

The PID system provides automated information to passengers about stations enroute.

The system components:


- A keypad and LCD screen to set-up the route
- A GPS device that determines where the vehicle is
- Display units in the carriages and the side window that show the next stopping station or the present station.
- A controller that interprets the GPS information and the set route to display the appropriate local and destination station information
- A link to the PA system to provide announcements supporting the information shown on the displays

The PID system once set up correctly, automatically updates information displayed on the carriage displays as the geographical location of the train changes.

If a route has been set up and the direction or route of the train changes, the PID system ceases to show destination and route.

## 23.0 FAULTS

### 23.1 Jumper Cable Fault

If...	Then
<p>Jumper cable falls out or is damaged</p>	<p>The Locomotive Engineer will see the Smoke and PEB lights illuminate and the buzzer will sound. If the PEB is not bypassed or the FRT mode selected within 10 seconds the brakes will apply.</p> <p>Door control release will not work.</p> <p>If a jumper cable issue occurs switch to FRT position, advise the Train Manager.</p> <p>The Train Manager can obtain the Locomotive Engineers door release by using the SRV Cab Door release push button.</p>  <p>The doors will only release on carriages that are TMS jumper cable connected to the SRV.</p> <p>On other carriages that are not jumper cable connected:</p> <ol style="list-style-type: none"> <li>1. Move passengers internally between the carriages that the doors are still capable of being used</li> <li>2. Train crew will use the internal emergency door release switch (on the door control panel) to detrain passengers.</li> </ol>

## 24.0 TOWING

**NOTE:** It is imperative that, at all times, the procedures implemented to provide assistance do not, at any time, create a situation that is unsafe.

### 24.1 General Requirements

SR park brakes must be cut-out when conveyed on a train with direct release brakes (brake pipe only connected e.g. a freight train)

- Both bogies must be cut-out using the isolating cocks.
- The triple valve must be cut-in to ensure the supply reservoirs continue to be charged from the brake pipe.

**WARNING:** This is important to maintain air bag pressure

To ensure that an assisting / being assisted mission is carried out safely:

- Communication occurs between personnel involved in moving, getting under vehicles or isolating equipment so that there is a common understanding of what is happening or about to happen
- The vehicle to be assisted has no physical defect that is hazardous i.e. can harm passers-by or that could derail the vehicle when it is moved
- Vehicles at the ends of the assisting / being assisted consist have the air brake connected through and their air brakes functioning i.e. there is no unbraked vehicle at one or other ends
- Passengers will need to be taken off as soon as practicable – precautions need to be taken on cars that have affected air and electrical systems as both main reservoir air and a 24 volt electrical supply are required to enable the saloon doors to function
- Piloting Movements: If a propelling movement takes place, it must be piloted from the head of the consist in communication with the LE operating the propelling locomotive
- Headlights and taillights: To be on as for normal operation

## 24.2 Assisting / Being Assisted Options and Limitations

### 24.2.1 Vehicle Characteristics

The one element common to all vehicles is:

- An air brake that can be applied and released by exhausting from and applying air to the brake pipe from anywhere on the assisting / being assisted consist.

This common facility throughout the consist provides the fundamental safety feature for any vehicle movement as the air brakes can be applied by any person no matter where they are located on the assisting / being assisted consist.

This means that the minimum requirement for any movement to take place is an airtight brake pipe that can be charged from at least one compressor on the consist

It will simplify matters if as many of the systems as possible on the vehicle to be assisted are kept operating. This will simplify assisting procedures e.g. keeping the DA set running on the vehicle being assisted keeps batteries charged and keeps the compressor running.

Where like vehicles are the assisting / assisted vehicles:

The setting up requirements prior to moving the vehicles are simple but will differ for each circumstance depending on the type of defect the vehicle to be assisted has. It is likely that the assisted / assisting consist can be driven from the leading end of the assisted or assisting vehicle.

Where unlike vehicles are the assisting / assisted vehicles: The scenarios are more limited, how limited will depend on the vehicle types and the reason for the breakdown. A propelling movement may be required.

Assisting and being assisted limitations and restrictions:

The vehicles (train) providing assistance must:

- **proceed at a low speed when assisting another set of vehicles**
- be physically capable of providing assistance i.e. be both heavy and powerful enough to get the vehicles to be assisted moving
- not be damaged by being used in a manner it was not designed to be

## 24.3 Towed by another locomotive

### 24.3.1 Locomotive fitted with Running Capability features

<b>26L Brake</b>	<b>Lead Loco SR Train</b>	<b>Dead Loco 3 Pipe couple to SR train</b>
<b>Automatic Brake Valve</b>	Release	Handle Off
<b>Brake Valve Cut-Off Valve</b>	PASS	Cut-Out
<b>Independent Brake Valve</b>	Applied	Release
<b>MU2A Valve</b>	Lead or Dead	Trail 6/26
<b>Running Capability Features</b>		
<b>FRT / PASS Switch</b>	PASS	FRT
<b>Train-line Jumper cable</b>	Coupled to dead locomotive	Couple to train and live locomotive
<b>Battery Knife Switch</b>	In	Out
<b>Locomotive Engineer</b>	Lead Cab	Lead Cab

**24.3.2 Locomotive not fitted with Running Capability features**

<b>26L Brake / 26LA Brake (CCBIIP Brake)</b>	<b>Lead Loco SR Train</b>	<b>Dead Loco 3 Pipe couple to SR train</b>
<b>Automatic Brake Valve</b>	Release	Handle Off
<b>Brake Valve Cut-Off Valve</b>	PASS (PA)	Cut-Out
<b>Independent Brake Valve</b>	Applied	Release
<b>MU2A Valve</b>	Lead or Dead (PA)	Trail 6/26
<b>Running Capability Features</b>		
<b>FRT / PASS Switch</b>	Not fitted	FRT
<b>Train-line Jumper cable</b>	No coupling ability	Couple to train
<b>Battery Knife Switch</b>	In	In
<b>Locomotive Engineer</b>	Lead Cab	Second Locomotive Engineer in DFB to give door release