Rail Operating Code

Code Supplement CS 4.16

Operating Instructions for Capital Connection SR Class Carriages and DFB Locomotives

Issue number	Prepared (P) Reviewed (R) Amended (A)	Approved by	Authorised for release by
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Contents

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 ¼ and ¾ positions on the side of the carriage.

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

In 2022 / 2023 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.
- SRG (Scenic Regional Generator) ex driving carriage with diesel-electric generator sets for supplying power to the carriages.

The SRG contains a generator that can power up to 9 carriages. 1 SRG, 1 SRC and 7 SR. If more than nine 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	SRG
Single side door	✓	-	-
Double side door	✓	✓	✓
End door	✓	✓	✓ (Cab end)
Wheelchair lifter	-	✓	-
Wheelchair spaces	-	✓ (2)	✓ (2)
Café	-	✓	-
Luggage racks	✓	-	✓
Bike spaces	-	-	✓ (Doubles as wheelchair area)
Seats	50	21	38
Toilet	✓	✓ (Wheelchair)	-
Driving cab	-	-	✓
Emergency exit ladder	-	-	✓
Generator	-	-	✓

3.2 Carriage Seating Capacity

	Passengers Seated	Passengers Standing	Total Passengers per Car	In Service Car
SR	50	36	86	7
SRC	21	29	50	1
SRG	38	22	60	1
Total				**9**

	Total Passengers per Carriage	Crush Loaded Passengers	Total Crush Loaded Passengers per Train
SR	602	154	1078
SRC	50	136	136
SRG	60	102	102
Total	**749**	**392**	**1316**

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	86 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
Tare	35,000 kg
Seating capacity	50 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 16 hand straps

3.5 SRG Carriage

Length over drawgear	15,856 mm
Overall width	2,744 mm
Overall height	3,715 mm
Floor height	1,068 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 ‘Capital Connection’ Palmerston North – Wellington 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.
- Some passenger DFB locomotives have additionally 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.

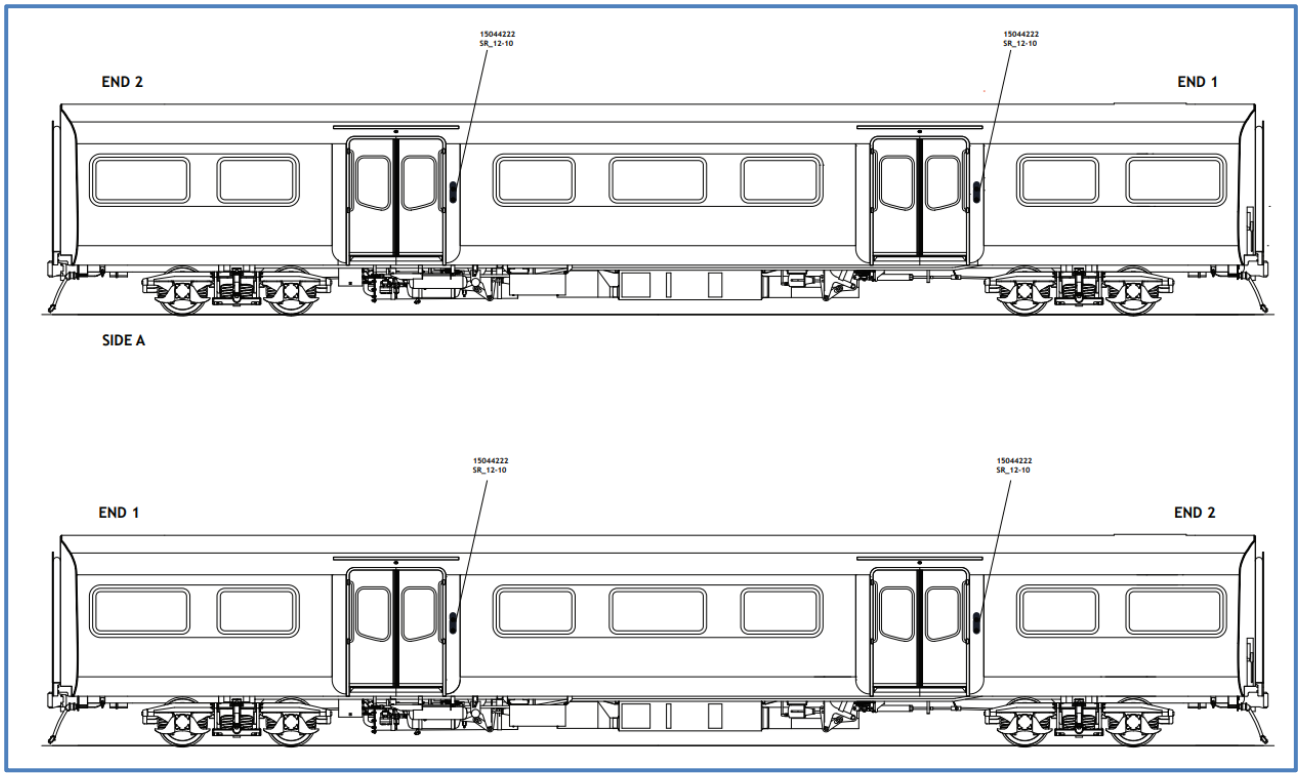
- Carriage Controls:
  - Air conditioning fresh air intake, open / close
  - Park brake, apply / release.

- Door Controls:
  - Door release
  - Door close indication
  - ‘Right of Way’ gong from the onboard staff
  - Emergency release

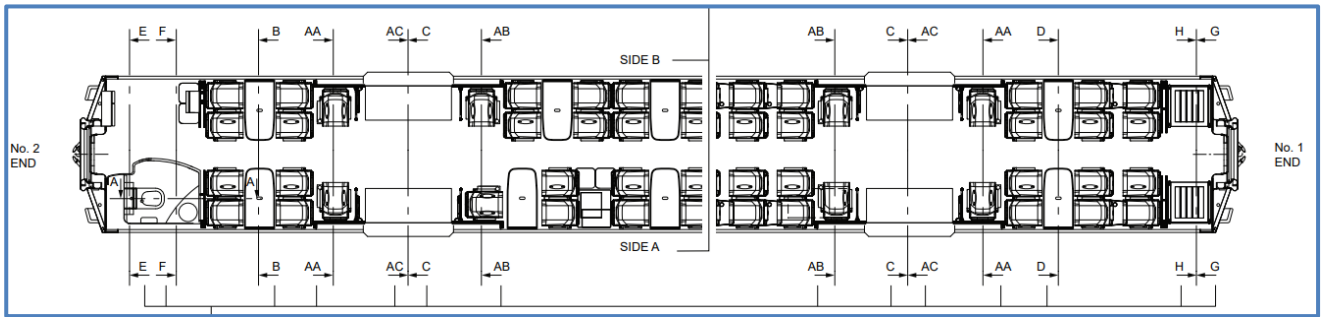
- Hard wired intercom to the carriages
- Jumper cable sockets (4) one on each side of the front and rear headstocks
- Ability to override a Passenger Emergency brake activation
- Train Monitoring System (TMS) information panel
- Traction interlock – no traction power while the doors are open
- On some locomotives an ETP DMI panel has been fitted underneath the driver’s lunch tray

4.0 GENERAL DIAGRAMS

4.1 SR Carriage

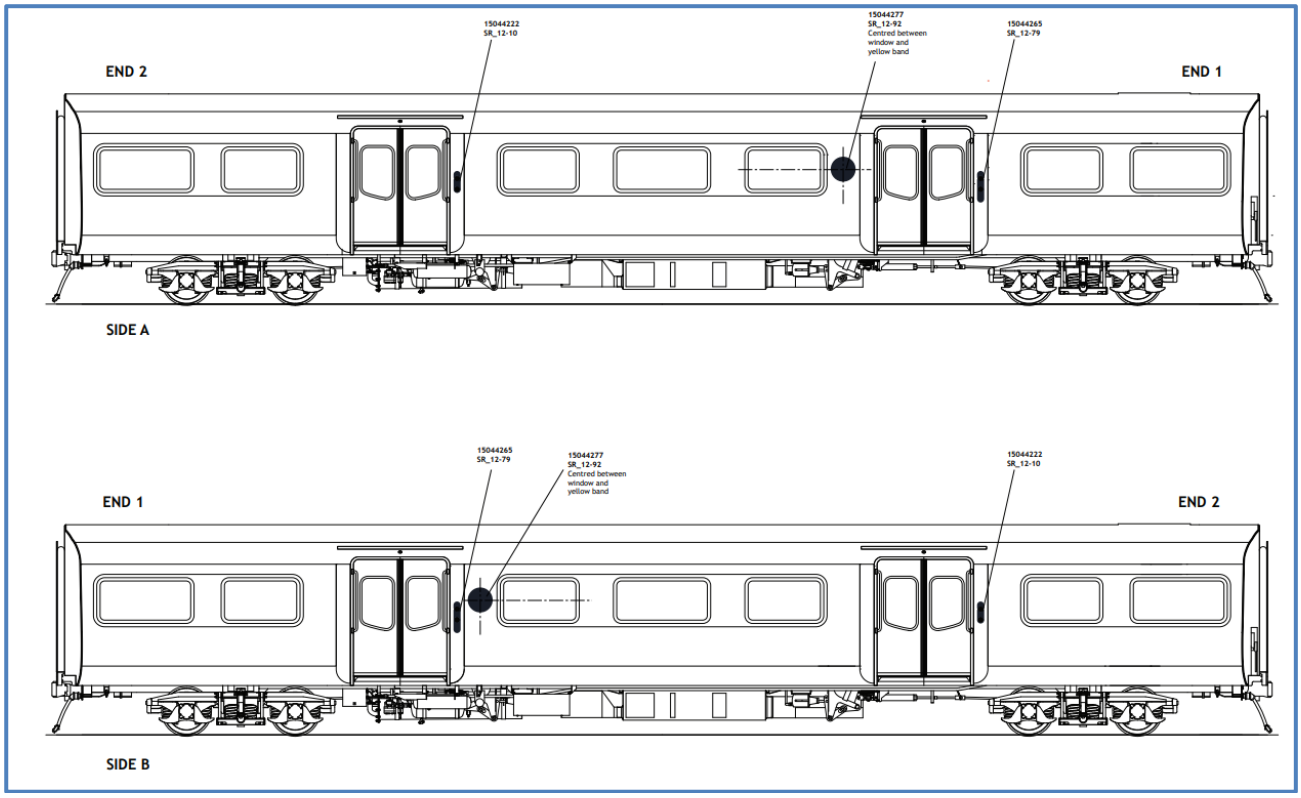


Side Elevations



Internal Layout

4.2 SRC Carriage



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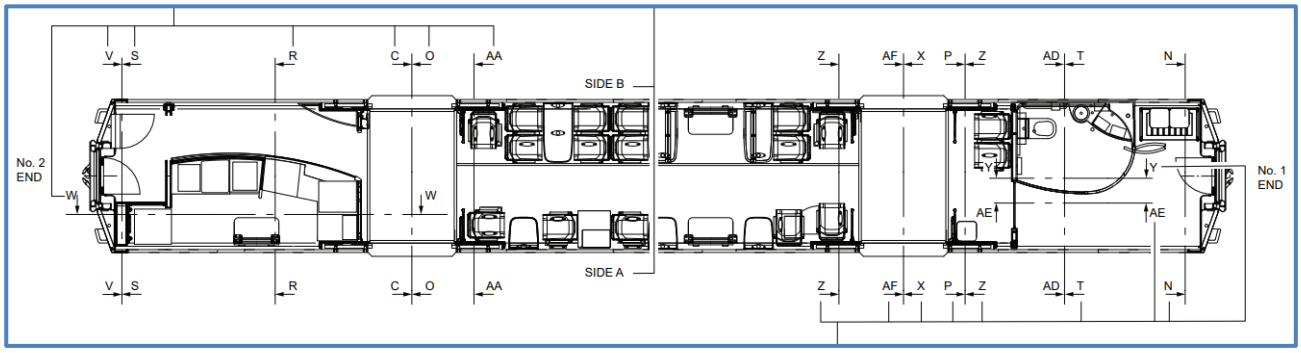
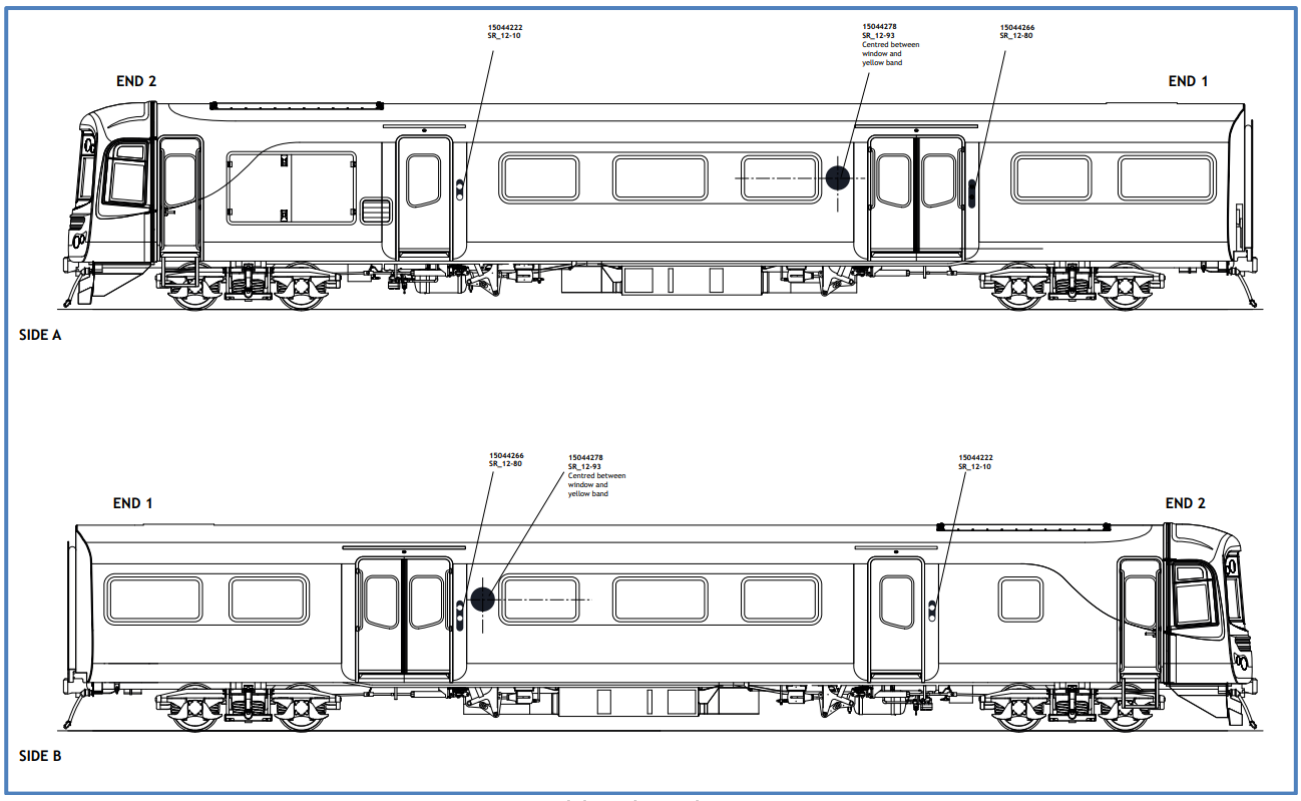


Internal Layout

4.3 SRG Carriage



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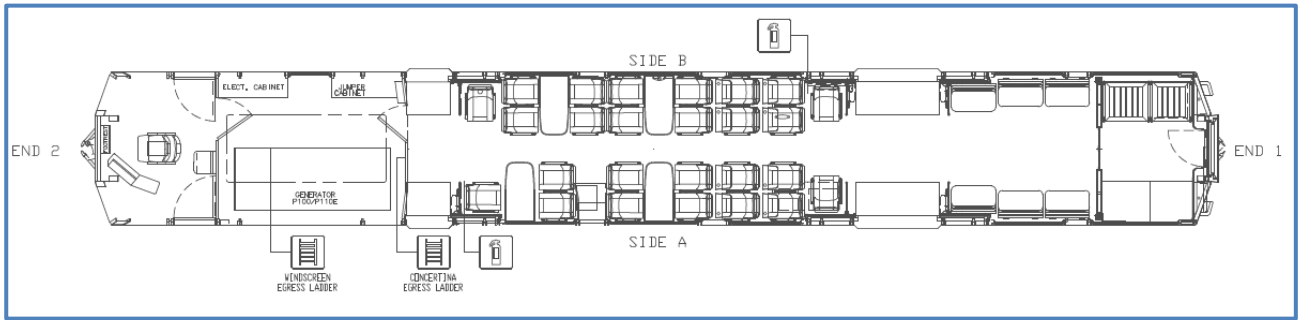


Internal Layout

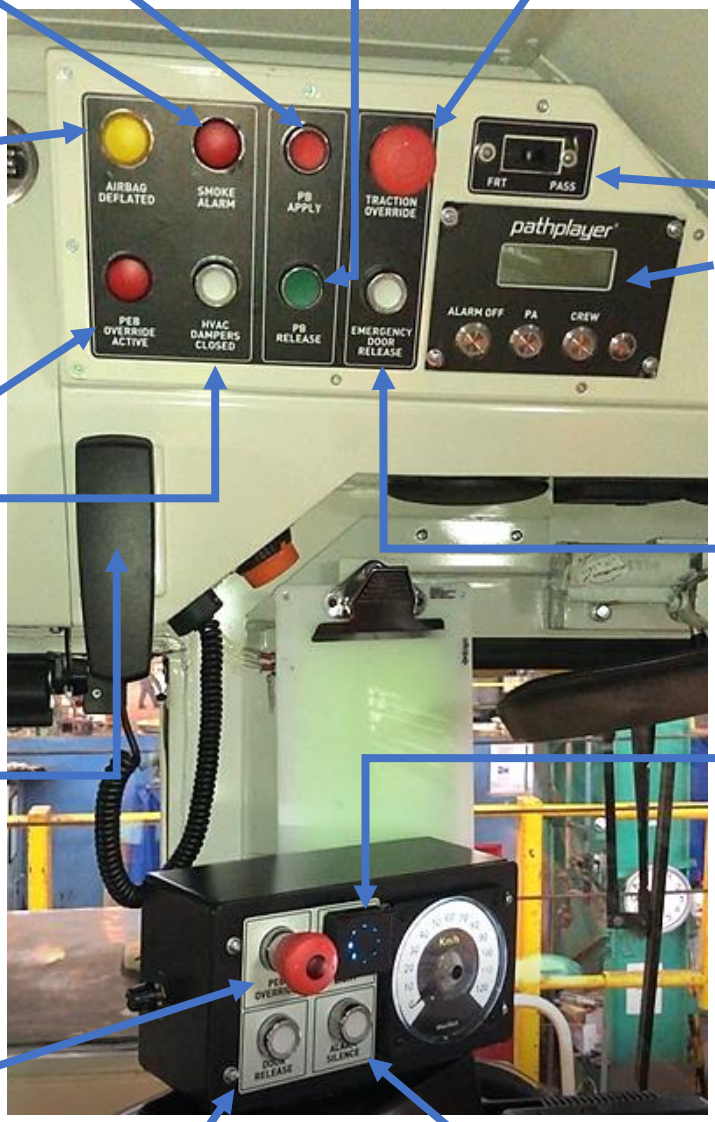
5.0 CAB CONTROLS AND LAYOUT

SRG gauge panel controls, indicators, and gauges

SRG control stand


pathplayer
POWER
KiwiRail
pathplayer
SRG 6182
SRC 6159
SR 5968
SR 6172
SR 6010
SR 5975
SR 5784
ALARM OFF
PA
CAB
PEI
CREW
GARMIN
HORN ISOLATING COCK FITTED

SRG Cab TMS

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

DFB gauge panel controls, indicators, and gauges

5.1 Gauge Control

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: • Freight train • Passenger train not fitted with new universal passenger systems monitored from the locomotive	Lead locomotive on: • SR and other carriages that have the new universal passenger system monitored from the locomotive

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.	Red ‘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 to the carriages 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.

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

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	1. Operate the Traction Override button. 2. Record the fault in the 54D book and iPad
Door closed blue light not illuminated	1. Contact the Train Manager to get them to open and close all doors 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 3. Get the Train Manager to visually check all doors are closed If the above checks find all equipment is normal: 4. Operate the Traction Override button 5. Record the fault in the 54D book and iPad

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

5.2.10 Communication and Entertainment Radio

The entertainment radio is powered by a 24V DC circuit breaker. This circuit breaker is in the generator room electrical cabinet, this circuit breaker must be on for the radio to operate.

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 SRG car.

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

5.3 Train Monitoring System

Refer Instruction 8.8

5.4 Warning Lights and Alarms

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 30 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 Lights

The cab light switches are located on the right-hand side of the generator access door. These lights are powered from the 24V DC circuit breaker located in the generator room electrical cabinet.

5.5.5 Generator 24V DC Lights

24V DC emergency lights are located above the walkway in the generator room. These lights are turned on using the switch on the electrical cabinet.

Generator room lighting and air conditioning controls

5.6 Auxiliary Lighting

The auxiliary lights operate off 24V DC circuit breaker 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 SRG.

5.6.2 Taillights

The taillight switch located on generator room electrical cabinet. It switches on the two red LED lights at the top corners of the cab on the SRG.

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 doorstep 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 / Ditch lights

For the headlights to operate, the 24V DC circuit breaker 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 Ditch lights off.
- DIM – Headlights are dipped, and Ditch lights are Dim Beam
- FULL – Headlights and Ditch lights on Full Beam

5.7.1 Ditch light Flashing

When the ditch light flasher button is pressed, or the horn is operated, the ditch lights 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 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 generator enclosure, accessed via the external door.

5.9 Cab Equipment

The standard cab equipment includes hand wipes, rubbish bin, and coat hooks. These are all located in the cab.

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 footrest (The generator must be running for the foot warmer to operate).

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 buttons in passenger compartments are reset

7.0 START UP PROCEDURE

7.1 Disconnect Electrical Shore Supply

1. If the shore supply is connected to the SRG 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 SRG 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:

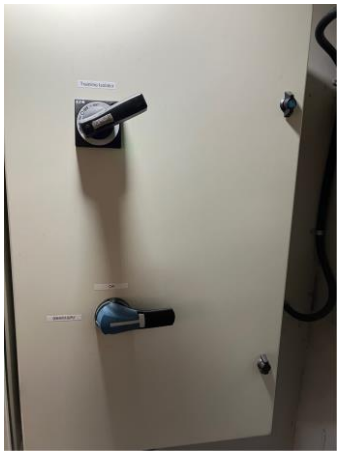
- Pressing the emergency brake push button at any saloon door station
- Pressing the emergency brake push button in the cab
- A penalty brake application initiated by the Tranzlog event recorder

If a saloon door emergency stop push button has been pressed, the Train Manager is to ascertain the reason and advise the Locomotive Engineer. The position is displayed on the TMS screen.

8.3 SRG Generator

8.3.1 Start Up from SRG Cab

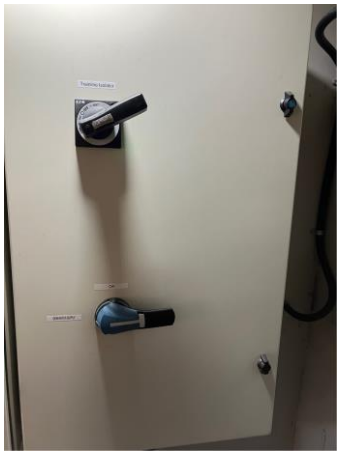
This is the preferred start method

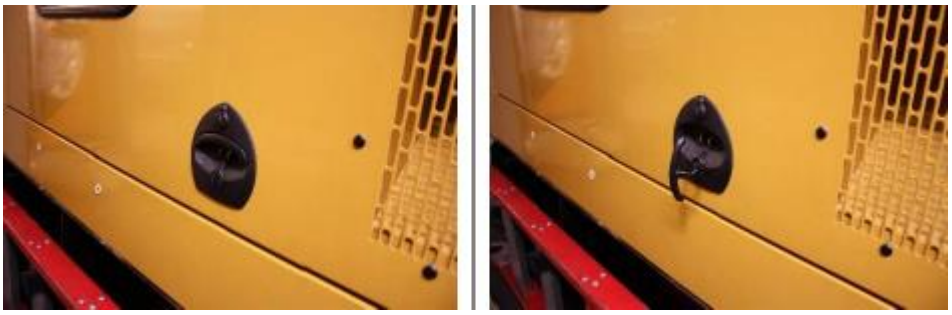
Step	Action
1.	Turn on the 24V circuit breaker in the SRG carriage
2.	Check that all mains power circuit breakers are OFF in the carriages. This reduces the load on the generator starting
3.	Confirm Generator/Shore Supply Switch is in “Generator” position and Trainline Isolator Switch is in “On” position. 

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

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 SRG carriage
2.	Check that all mains power circuit breakers are OFF in the carriages. This reduces the load on the generator starting
3.	Confirm Generator/Shore Supply Switch is in “Generator” position and Trainline Isolator Switch is in “On” position. 

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

8.3.3 Shut Down

Step	Action
1.	Turn off all the main and 24V circuit breaker on all carriages
2.	Go to SRG cab start station
3.	 In the cab, move the Generator Remote switch from Run to STOP
4.	Wait 3 minutes until the generator stops

8.3.4 Emergency Shutdown

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

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

Located on the generator enclosure, 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 Brake Test

8.4.1 Brake Test Procedure:

- 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 SRG brake cylinder gauge will register the higher of the locomotive or SRG 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 SRG 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.

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

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

Set Up Carriage as follows:	
1.	Switch on the taillights at the trailing end carriage
2.	Secure end door

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:

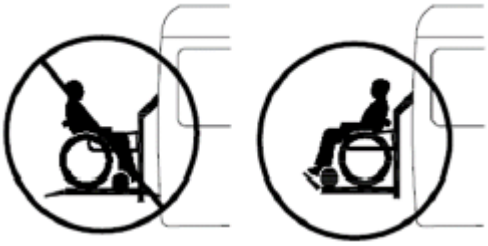
- the locomotive cab
- the TMS screen
- the switchboard, and
- the internal PID's

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

	
Hoist retracted position	**Hoist extended position**

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.

Two spaces are available in SRG if SRC is not in service. (Note wheelchair ramp is needed for boarding)

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 a 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	• Low voltage warning
CCTV	• Camera fail • Hard drive fail
Doors	• Train Manager key switch – multiple key alert • Door isolated • Door open / closed • Magnetic lock locked or unlocked • Right of Way (RoW) or gong

End of Train Safety	• Electrical safety circuit not safe i.e.
	  ○ Power cable or socket cap open
	  ○ TMS cable or air hose detached
	  ○ AAR jumper cable socket open

Heating, Ventilation and Air Conditioning (HVAC)	• Duct Sensor to sense smoke
	• Status of Tunnel mode
	• Carriage Smoke detector
	NOTE: HVAC dampers close automatically on each unit when external smoke is detected
	• HVAC damper control
	  ○ Recirculation
	  ○ Tunnel Mode
	• Emergency Supply air fan turned on:
	  ○ Emergency mode
	  ○ Running on emergency power

Passenger Emergency Brake	• Activated
Passenger Help call points	• Activated
Smoke Detector	• Smoke detector activated
Generator Status	• Generator fire suppression • Generator running

8.8.2 Systems monitored in locomotive

Item	Details
Airbag deflated	• Low voltage warning
Smoke detector	• Smoke detector activated
HVAC dampers	• Dampers closed
Park Brake	• Applied • Released

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 • The PA button will illuminate, and LCD will show ‘PA in Progress’ message
3.	Hold the PTT orange button on the handset to make the PA announcement, release when finished talking. • PA announcement will be made in all cars
When finished	
4.	Return handset to the cradle
5.	Press the PA button • The LED in the PA button will extinguish, and the LCD will return to the default mode

For communications from Crew to Train Manager / SRC Café

Step	Action
1.	Press the CREW button
2.	Remove the handset from the cradle • The CREW button will illuminate, and LCD will show ‘crew call’ activated message • PID will display ‘TM to Office’ • A buzzer will sound in the TMS panel in the Train Manager’s Office and Café
3.	To answer a Crew Call • Remove the handset from the cradle • Press CREW button • The LCD will show ‘crew call in progress’ • Talk without pushing the PTT orange button on the handset
When finished	
4.	Return handset to the cradle
5.	Press the CREW button • The LED in the crew button will extinguish and the LCD will return to the default mode

For communication to the Locomotive Engineer

Step	Action
1.	Press the CAB button
2.	Remove the handset from the cradle • The CAB button will illuminate, and LCD will show 'Driver call' message
3.	In the locomotive a buzzer will sound, and the CREW button will illuminate. LCD will show 'Driver call' message • Locomotive Engineers press the CREW button to acknowledge the call • Remove handset from the cradle • Communication between Crew and Locomotive Engineer can start • Talk without pushing the PTT orange button on the handset
When finished	
4.	Return handset to the cradle
5.	Press the CREW button • The LED in the CREW button will extinguish and the LCD will return to the default mode

8.8.4 Help Call Points

These are located:

- SR and SRG 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 doors 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 • The LCD will show ‘Help Call’ message
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 • The LCD in the PEI will extinguish, and the LCD will return to the default mode

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 SRG 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 SRG 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 SRG 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 SRG 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 SRG 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 remain 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 SRG 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 the 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 park 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
1.	**Cut-Out the Air Brake**
1a	Locate the two brake cylinder isolation cocks on isolation panel, B Side 
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
2.	**Cut-Out the Park Brake**
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	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 
2d	Complete an intermediate brake test on the carriage to confirm: • The bogie(s) with cut-out brakes do not apply • The other bogies, the brakes do apply • The next carriage, the brakes do apply
2e	Mark-up on the carriage BCO HB and date on both sides  Record carriage number and bogie cut-out in the 54D book and iPad

13.2.2 Cut-Out air brakes on whole carriage

Step	Action
1.	**Air brake isolation by carriage**
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
2.	**Park Brake isolation by carriage**
2a	Locate the cut-out cock – look for label ‘park brake apply cock’ on the isolation panel, B Side 
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
3.	Complete an intermediate brake test on the carriage to confirm: • The bogie(s) with cut-out brakes do not apply • The other bogies, the brakes do apply The next carriage, the brakes do apply
4.	Record carriage number and brakes cut-out in the 54D book and iPad

14.0 CUT OUT COCKS

Isolation cock panel is located beneath passenger side door, B Side, number 2 end.

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.

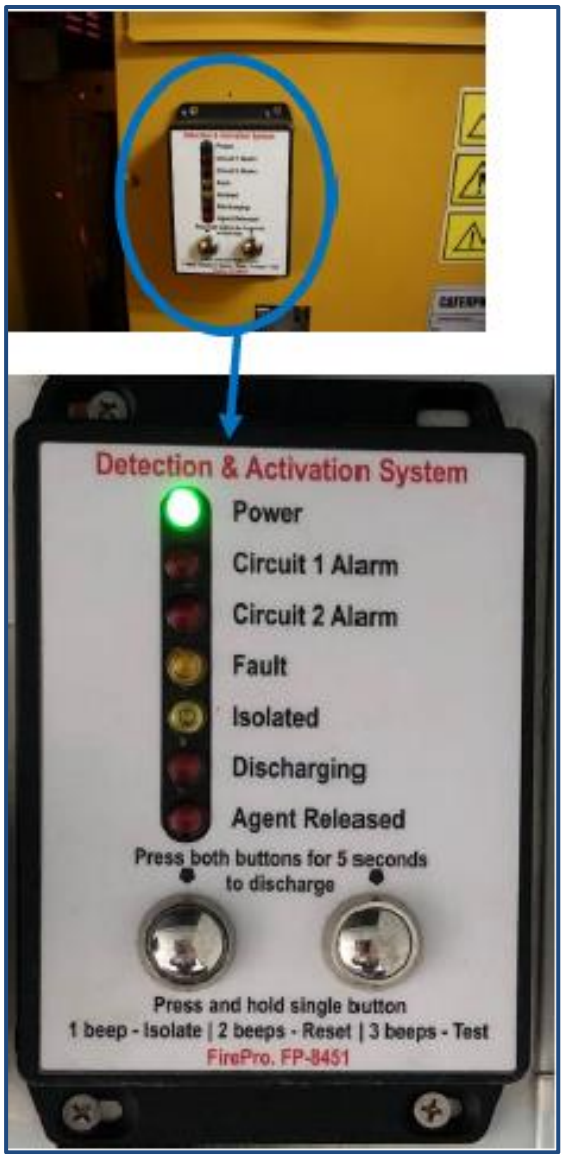
The sire suppression system monitors the temperature above the engineer using a thermal detection wire.
It is permanently ‘live’ and will operate without any interaction from the crew but can be manually activated.

In the event of a fire in the generator or the SRG 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 SRG car, or from the end car and along the locomotive using the evacuation ladders provided.

15.2.1 To evacuate passengers and crew through SRG 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)

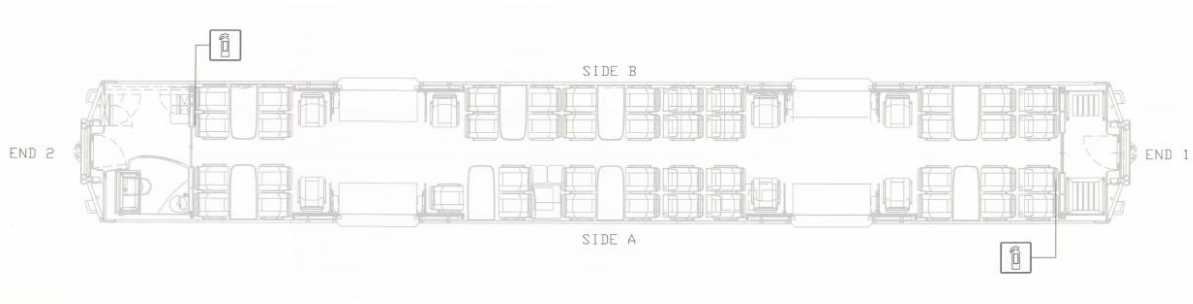
- Unlock the inter-car door of the end SR car next to the locomotive
- Hook ladder over opening
- Evacuate passengers and crew when secure

15.2.3 Ladder Stowing

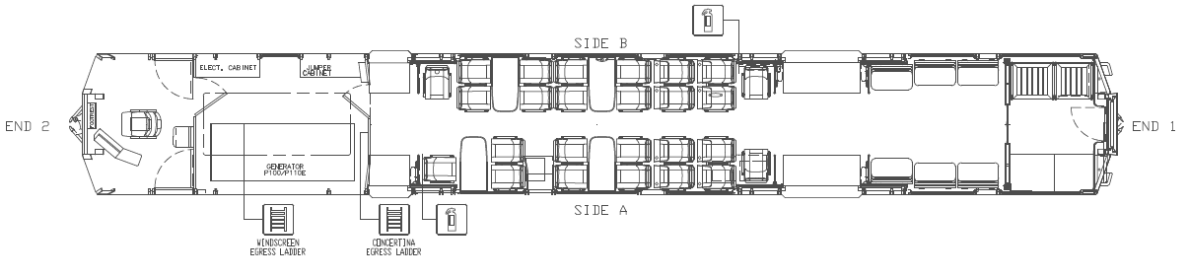
When stowing the ladder, ensure that the hooks are facing the saloon and not the cab.

15.3 Fire Extinguisher

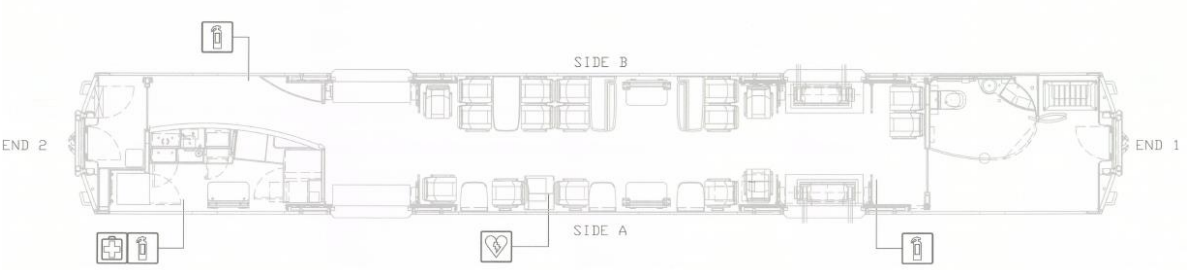
A hand-held fire extinguisher is in each SR car behind the seat and at End 1 and End 2.



The SRG car has two hand-held fire extinguishers; one is located beside single seat toward End 1, and the other is beside single seat toward End 2.



The SRC car has three hand-held fire extinguishers; one is located beside wheelchair door toward End 1, and the other is in walkway next to bin toward End 2.



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 SRG 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.

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 taillights	Two at each end of each carriage
CCTV	TMS cabinet mounted in each carriage
Cycles / pram area with securing belts	In the SRG
Emergency door release switches (four)	One at each door control panel
Emergency exit ladder	In the SRG 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

Equipment	Location
Floor mounted glow in the dark strips	• One along the length of the central walkway • Two (one each side) at the location of the external doors
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	With Train Manager
Smoke detectors	Ceiling mounted in each carriage
Train Monitoring System (TMS)	In each carriage and Information screen, in the SRG cab, café counter and locomotive
Wheel chocks (two)	In the SRG generator room in a red equipment bin
Wheelchair positions (two) with securing belts	In the SRC and SRG

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 SRG, 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’ • The system will open dampers to let in more fresh air • The air will not be cooled 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 4 degrees 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 isolation panel B-side of the car under each door are labelled on the carriage body as shown below.

19.3.1 Air Bag deflation

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1.</td><td>
<table>
<tr><th>If…</th><th>Then</th></tr>
<tr><td>1. Train is moving
2. Yellow airbag deflated light illuminates
3. Warning tone heard</td><td>• Slow the train immediately
• Contact the Train Manager, if unable to make contact, stop the train</td></tr>
</table>
</td></tr>
<tr><td>2.</td><td>
<table>
<tr><th>If…</th><th>Then</th></tr>
<tr><td>If speed is above 34 km/h</td><td>Tranzlog audible alarm will sound with a solid tone to indicate a read overspeed condition</td></tr>
<tr><td>If speed is below 28 km/h</td><td>Tranzlog audible alarm will stop</td></tr>
<tr><td>If no action is taken to apply the brakes</td><td>The overspeed condition will apply penalty brake after 10 seconds</td></tr>
<tr><td>If the train brake is applied during the 10 second alarm period to slow sown the train</td><td>The penalty brake application will be supressed</td></tr>
</table>
</td></tr>
<tr><td>3.</td><td>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.
<table>
<tr><td>NOTE: If this is not done, pressure may continue to be lost via the ruptured airbag.</td></tr>
</table>
</td></tr>
<tr><td>4.</td><td>Travel to destination, maximum speed 30 km/h</td></tr>
</table>

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:

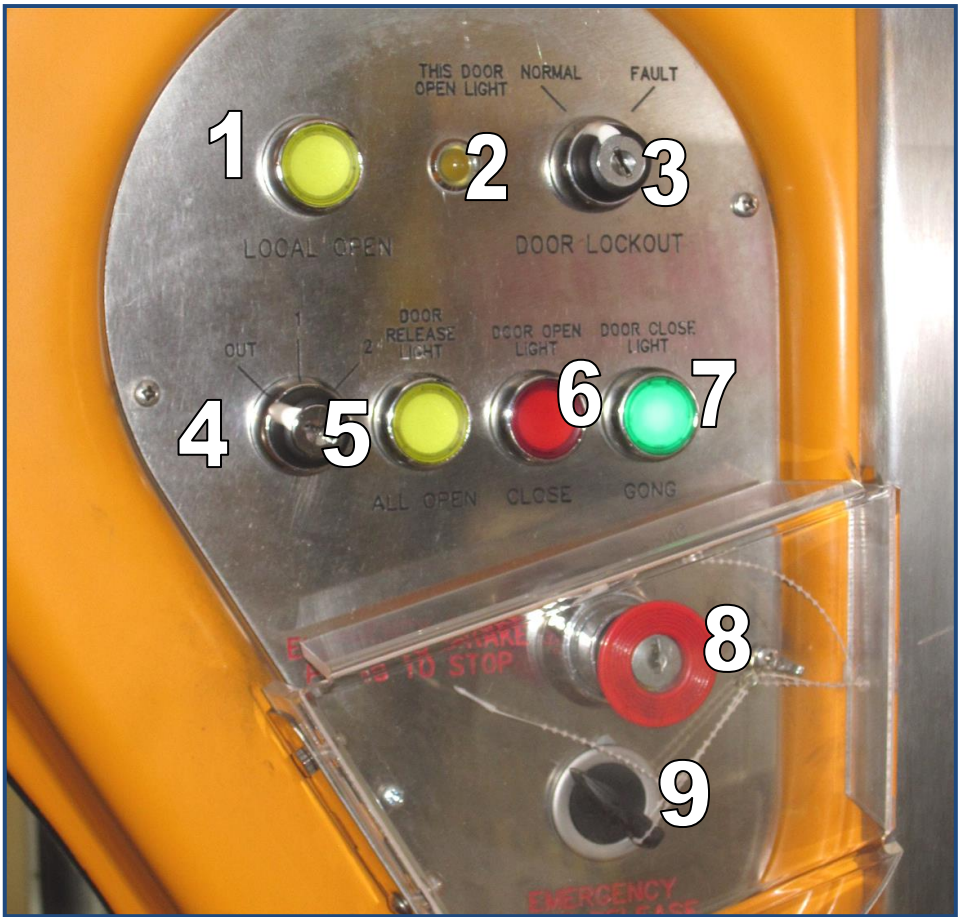
- To achieve a door closed light throughout the train and in the cab, all doors must be closed.

  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.

1.	**Local Open Push Button:**	Pressed to open this (local) saloon door only.
2.	**“This Door Open” Light:**	This light is on when this (local) saloon door is open.
3.	**Door Lockout Switch:**	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:

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

20.3 Locomotive Door Controls and Indicator Lights

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

1.	**PEB Override latching Push Button/Light:**	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.	**Alarm Silence latching push button**	This push button is used to silence the audible alarm as necessary
3.	**Door Release Push Button and Light:**	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.	**“Doors Closed” Light:**	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.

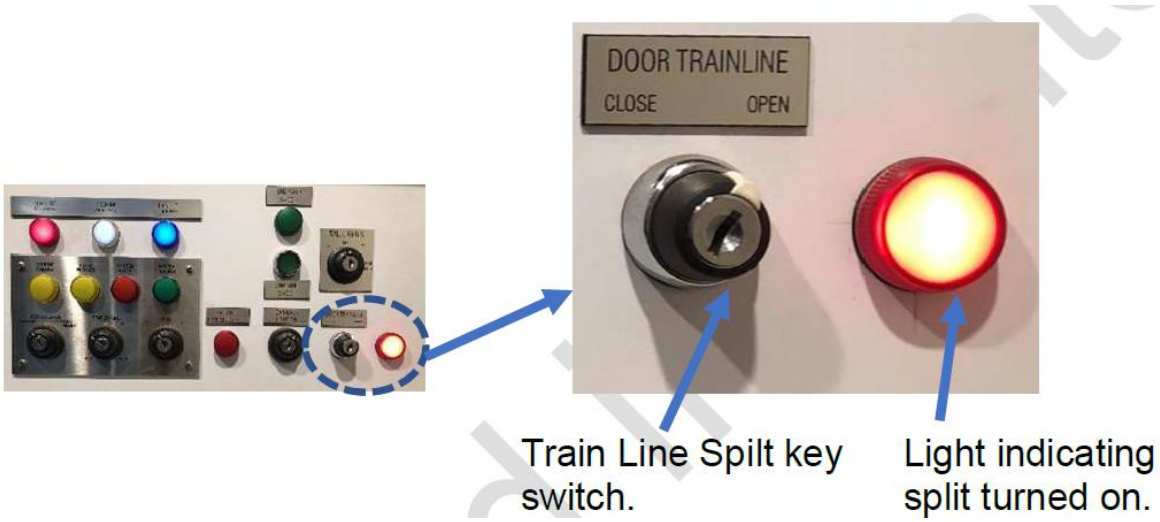
   The "Door Open" lights come on the instant the push button is pressed. The local door opens.

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

The “Door Trainline” switch is used when the train is longer than the platform to restrict passenger’s use of doors.
Door Trainline switch is on the electrical cabinet of each car.



When the Train Line split switch is turned to Open in a carriage, the door
control system is split in two halves:

1) SRG end
2) Non SRG end.

The end of the train where you put your door control key into the door control panel, is the end that you have control of the doors.

↓ Train Line split operated

SRG	SRC	SR	SR	SR	SR
		* door key used here			

← Passengers can open and close these doors →

↓ Train Line split operated

SRG	SRC	SR	SR	SR	SR
	* door key used here				

← Passengers can open and close these doors →

20.4.7 Door Control Panel Indications

"Doors Closed" lights	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).
"Door Open" lights	Are on at all door control panels and in the cab if one or more saloon doors on the train are open
"This Door Open" light (internal)	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.
"This Door Open" light (external)	Is provided above the saloon door outside the car This is useful, at night, to indicate a door that has not closed properly.
"Door Open" Alarm	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:

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

20.4.10 Emergency Door Release

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

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	• Slow the train immediately • Contact the Train Manager, if unable to make contact, **stop** the train.

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 pinned in place 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.

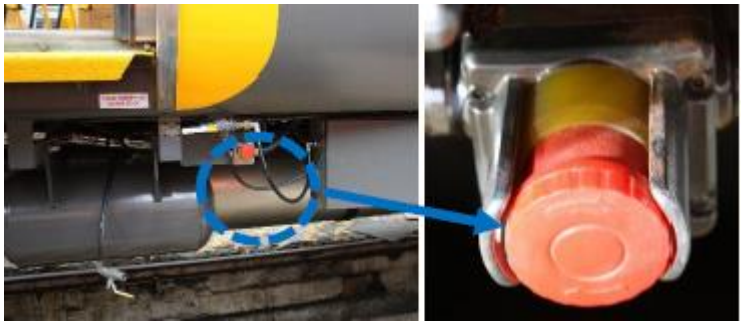
This switch is only to be used if a person must be extracted from a closed door or if passengers must be evacuated from the train. It is assumed that the saloon door cannot be opened in the normal manner.

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

Carriage Type	Internal Emergency Door Release Switch
SR, SRC	On all door control panels
SRG	Only on the double door control panel

Carriage Type	External Emergency Door Air Valve
SR, SRC, SRG	Under the side doors at the No.2 end of the carriage – both sides

Carriage Type	External Emergency Door Release Button
SR, SRC, SRG	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
Jumper cable falls out or is damaged	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. Door control release will not work. If a jumper cable issue occurs switch to FRT position, advise the Train Manager. The Train Manager can obtain the Locomotive Engineers door release by using the SRG Cab Door release push button.  The doors will only release on carriages that are TMS jumper cable connected to the SRG. On other carriages that are not jumper cable connected: 1. Move passengers internally between the carriages that the doors are still capable of being used 2. Train crew will use the internal emergency door release switch (on the door control panel) to detrain passengers.

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 Locomotive not fitted with Running Capability Features as Motive Power

24.2.1 Staff Requirements

If a Locomotive not fitted with Running Capability Features is used as motive power:

- The train must have an SRG with functional TMS and Emergency Brake.
- A suitably qualified staff member must be situated in the SRG cab when required to monitor PEB status and provide door release for train service.
- TMS system status is to be monitored by train crew and communicated to LE as appropriate.
- Communication between LE and train crew is via radio.

24.2.2 Locomotive Setup

26L Brake / 26LA Brake (CCBIIP Brake)	**Lead Loco SR Train**
Automatic Brake Valve	Release
Brake Valve Cut-Off Valve	PASS (PA)
Independent Brake Valve	Applied
MU2A Valve	Lead or Dead (PA)
Running Capability Features	
FRT / PASS Switch	Not fitted
Train-line Jumper cable	No coupling ability
Battery Knife Switch	In
Locomotive Engineer	Lead Cab

24.3 Assisting / Being Assisted Options and Limitations

24.3.1 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

24.4 Towed by another locomotive

24.4.1 Locomotive fitted with Running Capability features

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

24.4.2 Locomotive not fitted with Running Capability features

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