



## Passenger Carriages

KiwiRail operates long distance passenger services under the Tranz Scenic banner. These include the Overlander between Wellington and Auckland, the TranzAlpine between Christchurch and Greymouth and the TranzCoastal between Christchurch and Picton. KiwiRail has a fleet of 43 carriages long distance passenger carriages, including 26 big window carriages, 8 Capital Connection carriages for the daily commuter service between Palmerston North and Wellington and 9 smaller window carriages for use in its charter fleet. In addition there are 3 Silver Fern railcars and 11 luggage vans.

### RM CAR (SILVER FERN)

Built by Nissho-Iwai Company in Japan in 1972, the Silver Fern railcars initially ran the daylight Auckland-Wellington service, now known as the Overlander. Seating capacity proved too small, and they are now used in various regional and charter services. One railcar - RM30 - has recently been refurbished with new, larger windows. The other two cars are now being similarly upgraded.

#### RM1

Description	Auckland Metro Driver Motor Passenger car
Length over coupler faces	47,440 mm
Length over headstocks	46,580 mm
Bogie centres	17,374/17,552 mm
Overall width	2,743 mm
Overall height	3,759 mm
Floor height	1,200 mm
Tare	115,000 kg
Seating capacity	96 Passengers
Max. running speed	120 kph

### AO CLASS

KiwiRail operates a fleet of 56-ft wooden-bodied carriages dating from the 1930s. They have been retired from suburban service, but still operate long-distance trains. They are scarcely recognisable, having been extensively rebuilt with double-glazed panoramic windows, air-conditioning, and more modern bogies.



### S-SERIES

Starting in 1992 a large number of retired BR Mk2 carriage bodies have been imported and placed into service in New Zealand. These are made up of:

- » 8 S-class – Palmerston North-Wellington regional train service
- » 104 SA/SD class with sliding doors for push-pull suburban trains in Auckland (including 23 SD driving trailers)
- » 18 SW-class – Wairarapa regional train service
- » 6 SE-class interim Wellington suburban cars.

All received extensive bodyshell repairs, new HVAC and electrical reticulation systems, powered doors, and narrow-gauge bogies.

### SW CAR SW1

Description	Wairarapa Tranz Metro Passenger car
Length over couplers	20,381 mm
Length over headstocks	19,526 mm
Bogie centres	14,173 mm
Bogie wheelbase	1,829 mm
Overall width	2,744 mm
Overall height	3,580 mm
Floor height	996 mm
Tare	33,250 kg
Seating capacity	64 seated, 21 standing
Max. running speed	100 kph

### AK-CLASS

An entirely new carriage design is now under construction at KiwiRail's Hillside workshops in Dunedin to enhance Tranz Scenic's long-distance tourist train fleet. The AK class features very large panoramic windows and an all-new domestic bogie design, and will enter service in mid-2011.



## Depot and Workshops

KiwiRail's Mechanical business unit provides mechanical support to the wider business and external customers.

### HUTT WORKSHOPS

The team at Hutt Workshops undertakes maintenance and refurbishment of rolling stock, including heavy maintenance, repairs and locomotive overhauls.

This week, staff at the workshop will be carrying out a rebuild of a DX locomotive, refurbishment of a Ganz Mavag electric multiple unit, repair of a damaged DQ locomotive and rust repair on a DC locomotive.

### WELLINGTON PASSENGER DEPOTS REDEVELOPMENT

As part of the wider upgrade of Wellington passenger rail services, including the new fleet of Matangi trains, KiwiRail needed to provide more modern maintenance facilities, and additional electrified storage for the larger fleet.

A series of improvements have been made to the facilities in the Wellington Station precinct including:

- » Replacement of the Underfloor Wheel Lathe, with the new lathe located in a purpose built building on the west side of the main lines to minimise EMU shunting;

» Relocation of carriage maintenance activities which required the extension of two roads to eight car length, with a new pedestal pit; plus provision of a fuelling point and carriage toilet retention tank emptying facility in the vicinity;

» Building of a 90-metre extension to the north end of the EMU depot, with new features of a wheelset drop table, two new 15 tonne overhead cranes and a set of eight lifting jacks so an EMU can be lifted without disconnecting the two cars;

» Demolition of the oldest (1940s) section of the EMU depot, once the new Matangi fleet commissioning is complete;

» Electrification of four existing storage roads to accommodate the enlarged fleet between peaks;

» Building a new electrified wash plant for EMUs to increase throughput; and a second wash on east side of main lines to clean carriage trains, to avoid bringing them across the main lines for washing;

» Provision of fibre-optic connections to the depot offices, and renewal of gas, water, storm-water and electrical services.



# Rolling Stock & Depots

## Keeping trains moving

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## Locomotives

### DL-CLASS DIESEL-ELECTRIC LOCOMOTIVE

KiwiRail has ordered a fleet of 20 new diesel electric locomotives from Dalian Loco in China. Unfortunately the first of the new DL class fleet could not be included in the CORE 2010 technical tour due to shipping issues but the first of the fleet is expected in New Zealand shortly. These will be the first new locomotives in New Zealand since 1986 and will be used primarily on our busy Auckland – Hamilton – Bay of Plenty route and in the lower North Island. Designed and built by Dalian Loco, the DL features double cabs for 2-directional running, and an MTU 20-cylinder engine with common-rail electronic fuel injection.



#### TECHNICAL DATA

Engine service power	2700kW
Axle arrangement	Co-Co
Wheel diameter	936mm
Locomotive weight	108t
Axle load	18t
Traction gear ratio	93:18
Fuel tank capacity	4630L
Cooling water capacity	900L
Lube oil capacity	360L
Max service speed	100km/h
Continuous speed	28.8km/h

### DX-CLASS LOCOMOTIVE

KiwiRail's fleet of DX locomotives, originally introduced in the 1970s, has since been upgraded to the equivalent of a G.E. C30 Dash 8 Modified Micro International engine and micro-processor traction control system. The upgrade also included the KiwiRail/Otari Tranzlog vigilance control system, using hardware and technology to maximise fleet productivity. Productivity improvements to the DX class fleet have continued some coal route locomotives upgraded to 2Mn underframe and drawgear capacity.

#### TIMELINE

1972	'E' type introduced
1975	'CHEC' type introduced
1993	1 rebuilt to DXR (C30-7MI)
2005-2010	45 rebuilt to DXB
2006	1 DXR upgraded to DXR-2 (C30-8MMI)
2007	1 rebuilt to DXR-2
2010	1 upgraded to DXH 2Mn drawgear



#### TECHNICAL DATA

Locomotive manufacture type	G.E. 30-8MMI
Engine Model	G.E. 7FDL-12
G.E. Turbo	G.E. 7S16-12
No. of Cylinders	12
HP- Traction (@1050rpm)	3000
HP - total	3300
Traction Motors	G.E. 761-A24
Maximum Continuous tractive effort	297kN
Dynamic Brake	215 kN
Speed of max Dynamic Brake	16-32km/hr
Traction & auxiliary alternator	5GTA11
Driving Wheel Dia	940mm
Gear ratio	93/18
Max. speed	110 km/hr
Drawgear	2 MN
Fuel capacity (normal)	4546 litres
Water capacity	796 litres
Oil capacity	1205 litres
Sand capacity	728 kg
Weight	104 tonnes



## Ballast Cleaner and Clipper

KiwiRail's new Ballast Cleaner Group is part of a \$25 million project to improve the efficiency and quality of track maintenance. The Ballast Cleaner Group consist includes:

### RM 80-750 S BALLAST CLEANER

The Ballast Cleaner extracts ballast from under the track and screens it, processing up to 600m<sup>3</sup> of ballast per hour. Depending on the quality, the ballast is either returned to the track or rejected and stored in one of the fleet's wagons for disposal.

Length	49 m
Width	30 m
Height	3.8 m
Weight	129 T
Bogie centres	19 m
Wheel Diameter	910 mm
Total engine power	709 kW
Travel Speed	80 km/h
Chain Speed	0-3.6 m/s



### MFS 40-6 MATERIAL HANDLING WAGONS

These wagons are used to move and store ballast and waste material. The wagon floor is a moving conveyor, ensuring a continuous supply of new ballast is fed through from the wagons behind the ballast cleaner while the waste material from the cleaner is discharged into the wagons at the front of the fleet.

Unladen weight	42 T
Length over buffers	25 m
Bogie centres	15.5 m
Engine power	70 kW
Travelling speed towed, max	80 km/h

### DGS 62 N DYNAMIC TRACK STABILISER

The Dynamic Track Stabiliser helps bring track quickly back to line speed following tamping. Using load and vibration, it simulates the effect of many trains passing over the line.

Total mass	60 T
Length over buffers	19 m
Wheelbase	12.3 m
Engine power	429 kW
Travelling speed under own power/towed, max.	80 km/h



## Auto Clipper

The Auto Clipper is a self propelled machine which follows behind a concrete sleeper layer, automatically clipping up pandrols, replacing manual labour, creating health and safety advantages. It can process between 150-200 sleepers per hour, which equates to about 150 metres of track.

Overall length	8m
Height	3.5m
Width	2.5m
Wheel diameter	450 UIC
Engine power	110KW
Travel speed	25 km/h
Weight	7500 kg (unloaded)



## Matangi

Greater Wellington Regional Council has purchased a fleet of 48 two-car electric multiple units, named 'Matangi'. These will be used with the existing Ganz Mavag fleet on the Wellington 1600Vdc electrified area.

The first unit arrived in Wellington on 31 July 2010 for testing and commissioning with the first of the fleet expected to enter commercial service in December 2010. The full fleet will be in operation by the end of 2011.

The Matangi units have been designed and manufactured by Hyundai-Rotem in South Korea. The body shell of both the Power Car and Trailer Car are constructed largely from stainless steel. Most underfloor equipment has been put into the Power Car, enabling Trailer Car to be designed with a low floor section to improve accessibility.

From a passenger perspective the Matangi offers improvements in the form of air-conditioning, passenger information displays and public address systems including hearing loops, additional storage space under seats due to their cantilevered design and a CCTV system.

Common Name	Matangi
Manufacturer	Hyundai-Rotem
Year Built	2010-2011
Designation	FP - Motor FT - Trailer
Track Gauge	1,068mm
Line Voltage	DC 1,600V
Normal OH Operating Voltage	DC 1300V-1800V
Unit Length over Couplers	43,060mm
Car Width	2,730mm
Car Height	3,640mm ARL
Bogie Centre Pivot	15,300mm
Bogie Wheel base	2300mm
Floor Height	
- Lower Level Floor	730mm ARL
- High Floor	1,100mm ARL
- Door Footstep Height	730mm ARL
Unit Weight	
- AWO (MC)	42.1 tonne
- AWO (TC)	34.8 tonne
- Fully Loaded (MC)	55.2 tonne
- Fully Loaded (TC)	48.5 tonne
Bogie Design Axle Load	14.3 tonne
Power Rating	
- Traction Motor	4 x 170 kW
- VVVF	340 kW x 2 Units
- APU	50 kVA x 2 Units
Maximum Service Speed	110 km/hr
Maximum Acceleration Rate	0.84 m/s/s
Average Deceleration Rate	
- Service Brake	0.90 m/s/s
- Emergency Brake	1.20 m/s/s
Passenger Capacity	
Car Type	FP FT UNIT
Seating	76 71 147
Max Standing	109 121 230
Accommodation	
Wheelchairs	- 2 2
Bicycles	- 3 3

