porterbrook

Class 168 Diesel Multiple Unit

Contents

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Passenger Satisfaction

The Class 168 “Turbostars” were the first trains introduced after privatisation in 1994 and the successful series has continued in production until 2012 when the emphasis shifted to electrification. An excellent ride, quiet environment and flexible, modular design have ensured their popularity.

The vehicles are 23 metres long with 1/3 – 2/3 doors which means station dwell times are minimised. The swing-plug doors seal out noise and draughts so the passenger environment is as good as the classic “inter-city” style of end doors but the design is equally suited to commuter operations. Many services have frequent stops for part of their journey followed by longer runs more “inter-city” in character. The Class 168 design accommodates this requirement perfectly with rapid boarding, good acceleration and a comfortable environment suited to a longer journey.

Air conditioning is quiet, unobtrusive but effective, being supplied from two modules set into the roof above the doorways. Interlocking vents distribute the air without causing the draughts associated with some designs. All seats have access to a 230v ac mains socket for charging laptops and mobile phones. Toilets are fitted in every vehicle except the 5 MS vehicles which make up the Class 168/0 units to 4 cars.

Maximum speed is 100 mph and ride remains good at this speed. Seats are of the Chapman SC2X design, updated from the widely used SCIX with a modified headrest. These have armrests, good cushioning and a tapered top to improve visibility. These seats, combined with the large windows give a pleasant spacious feel to the vehicle and allow passengers to easily see if a seat is vacant. Some vehicles offer different seat designs in the same vehicle for more passenger choice.

The “Clubman” trains (as branded by Chiltern trains) have been successfully used on long distance services and have made a significant contribution to the growth of passenger numbers. Units are formed in 3 or 4 car sets, the original 3-cars being extended as demand increased. New vehicles have been introduced in a series of batches between 1997 and 2006 during which period Chiltern trains have gone from strength to strength, winning a string of awards and continuing to invest in more vehicles.


15

Refurbishment and Modernisation

Continuing improvement is assured as the vehicles are about to start a refresh programme to bring them back to as new train condition. Doors and seats will be overhauled and floor coverings renewed. The fleet will also be repainted with any body damage repaired.

The bodyshell is aluminium, with extrusions riveted together on to full length underframe and roof sections. Interior fittings are modular, built around standard window spacing, hence changes are easily achieved. Full width steel cabs are bolted to the bodyshell tube to provide energy absorption.

The units are compliant to disability regulations and are already fitted with features such as Passenger Information Systems, power points and Wi-Fi.

The Class 168 units differ from the rest of the Turbostar fleet as they are coupling compatible with the Ex - Network South East fleet of Class 165 diesel multiple units. Compatibility can be changed to provide common working with the Ex-Regional Railways “Sprinter” trains and Class 170 Turbostars if required, the mechanical couplings being the same BSI design.

There is the possibility of improving acceleration or fuel economy by fitting a mechanical ZF gearbox in place of the Hydraulic Voith transmission. This will offer either slightly improved acceleration or reduced fuel consumption depending on the chosen software configuration.


LEAMINGTON SPA
Chiltern Railways

Engineering

The bogies, being based on the widely used British Rail series 3 designs, are economical to overhaul and run 950,000 miles before receiving attention. This is achieved by de-coupling the wheelset repair, these being changed on condition as required.

Porterbrook owns large numbers of “Turbostar” vehicles and is continuously developing the product. A “user group” meets regularly to spread best practice across fleets so even operators running a small pool of vehicles benefit from design improvements.

From the earliest concept it has always been a key part of the design to maintain compatibility with Class 15X “Sprinter” vehicles. This has been maintained by ensuring modifications to the earlier vehicles (such as Passenger Information Systems) are compatible with the new Turbostars.

Air conditioning modules are mounted in the roof above the doors from where they pass cooled air directly into the roof ducts. They operate independently so in the event of one failing the other will still provide some cooling for the vehicle.

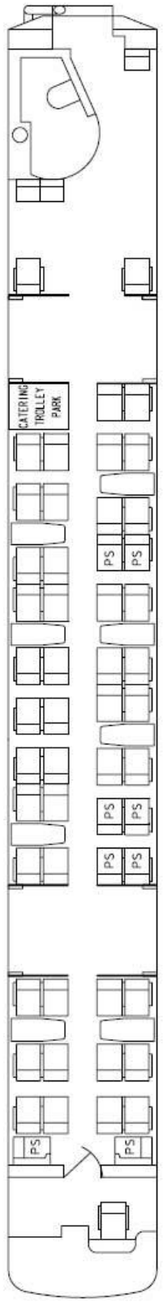
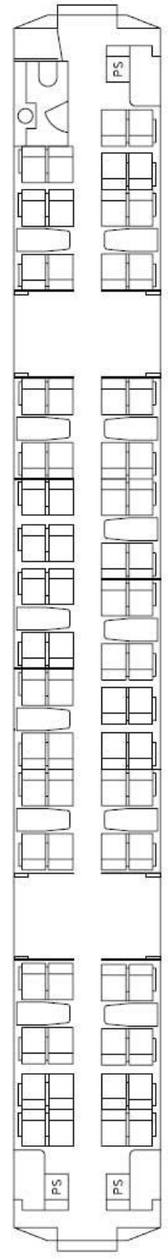
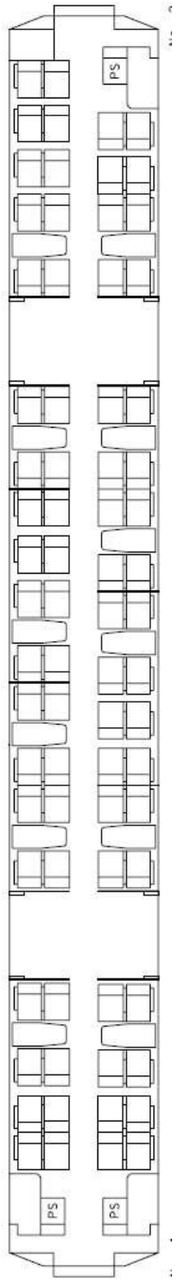
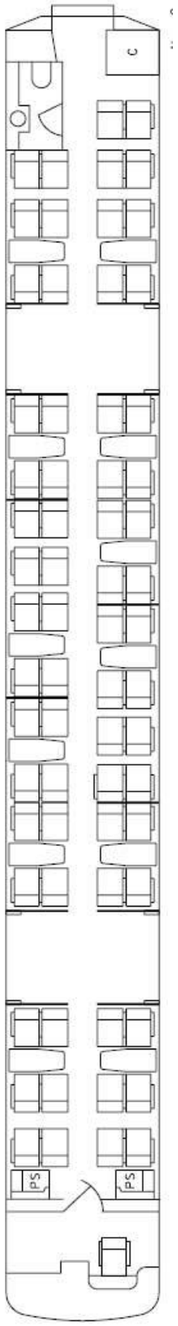
Technical Information

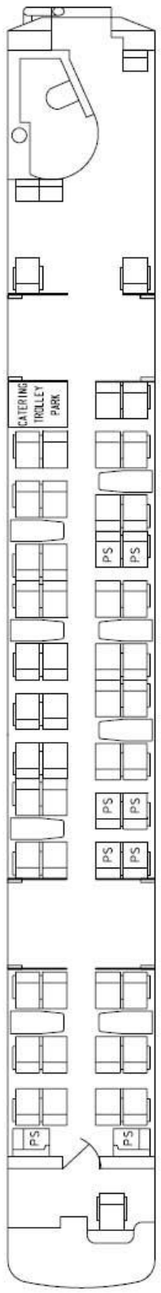
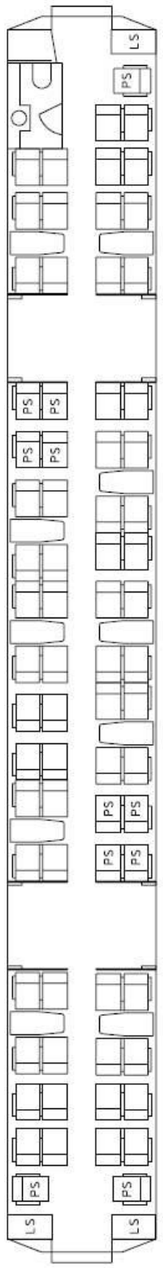
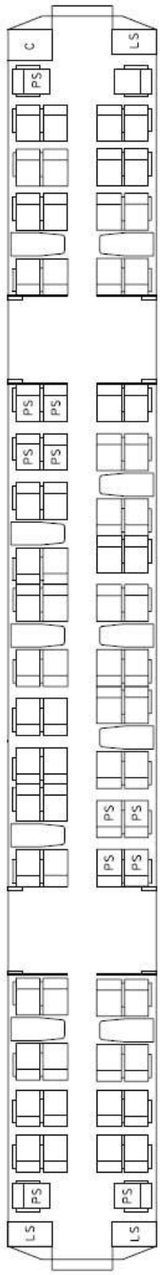
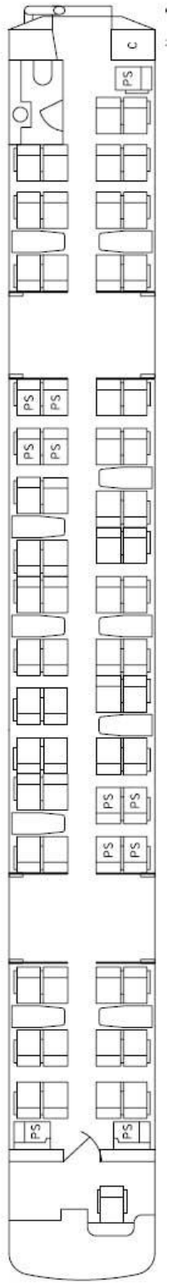
168 Data Sheets

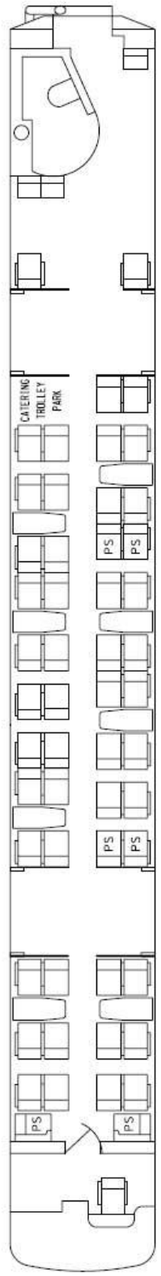
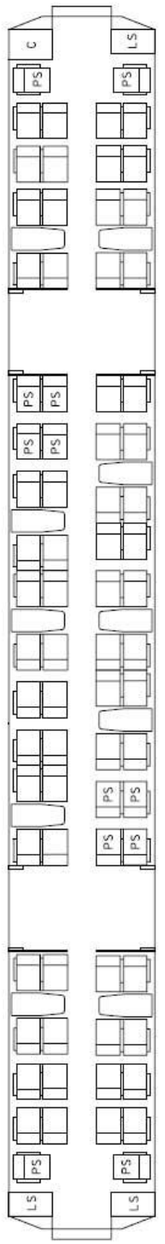
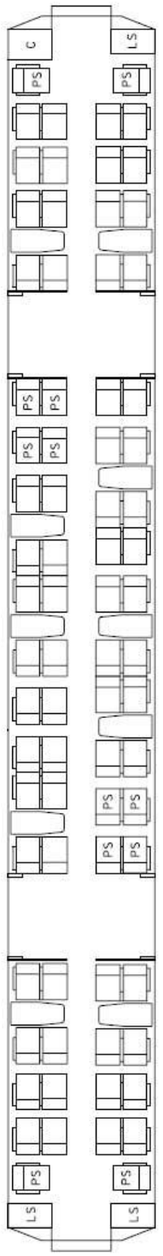
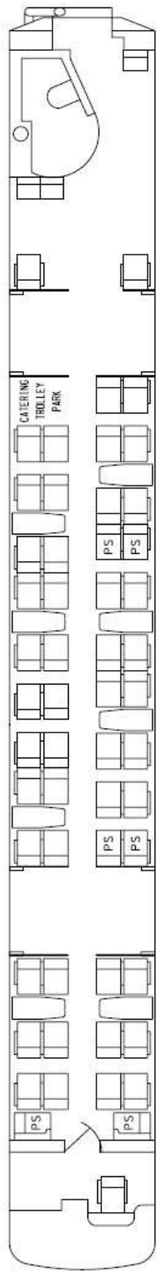
Basic information

	DMOSL(W)	MSL	MS	DMOSL
Class	168			
Sub class	/0, /1 and /2 Phase 1 – (5 Units) 168001 to 168005 (4 cars) Phase 2 & 4 (mix) – (2 Units) 168106 & 168107 (4 Cars) Phase 2 & 4 (mix) – (3 Units) 168108, 109 & 110 (3 Cars) Phase 5 – (4 Units) 168214 (3 Car) - 168215, 216 & 217 (4 Cars) (incl.6 new intermediates) Phase 6 – (2 Units) 168218 & 168219 (3 Car)			
Manufacturer	Adtranz - Bombardier			
Number of vehicles	19	10	19	19
Route availability	CI Gauge – Sprinter speed differentials apply			
Power	MTU 6R183TD13H 315kW (422hp) Diesel Engine	MTU 6R183TD13H 315kW (422hp) Diesel Engine	MTU 6R183TD13H 315kW (422hp) Diesel Engine	MTU 6R183TD13H 315kW (422hp) Diesel Engine
Hardware				
Length 168/0	24.1m	23.61m	23.61m	24.1m
Length Other 168	23.62m	23.61m	23.61m	23.62m
Width	2.69m			
Height	3.77m			
Gauge	Standard UK rail gauge (1435mm)			
Axle load				
Coupling compatibility	Outer: BSI Intermediate: Bar coupler	Outer: None Intermediate: Bar coupler	Outer: None Intermediate: Bar coupler	Outer: BSI Intermediate: Bar coupler
Performance				
Maximum Speed	100mph			
Acceleration	Unknown			
Braking Capability	Compliant with minimum brake performance curve as specified in Appendix 4, Group Standard GM/TT 0172.			
Braking System	Westinghouse 3 step friction brake			
Other features				
e.g. In-cab radio system, CCTV, other passenger-enhancing facilities.	CSR Radio Cab Cool system	Saloon CCTV	Saloon CCTV	CSR Radio Cab Cool system

	DMOSL(W)	MSL	MS	DMOSL
Day to day operation				
Door configuration	Pneumatically operated bi-parting swing/plug, 1/3 and 2/3 position (4 per vehicle).			
Seating Configuration	2+2 facing/unidirectional seating (club class only)			
No. of seats	57	73	168/0 = 77 168/1 & 2 = 76	168/0 = 68 168/1 & 2 = 69
Floor space for standing	22.63m^2	17.67m^2	17.67m^2	16.80m^2
Toilets	1	1	0	1

	DMOSL(W)	MSL	MS	DMOSL
Layout Diagram 168/0				

	DMOSL(W)	MSL	MS	DMOSL
Layout Diagram 168/1	 CATERING TROLLEY PARK PS			

	DMOSL(W)	MSL	MS	DMOSL
Layout Diagram 168/2				

Build dates

Unit / Rake	Vehicle	Specific Type	Date Entered Service
Note: This list is in a different format to other classes to accommodate the range of build dates as vehicles have been added to units			
168001	58151	DMSL(A)	26/05/1998
168001	58251	DMSL(B)	26/05/1998
168001	58451	MS	31/10/1998
168001	58651	MSL	26/05/1998
168002	58152	DMSL(A)	13/07/1998
168002	58252	DMSL(B)	13/07/1998
168002	58452	MS	04/10/1998
168002	58652	MSL	13/07/1998
168003	58153	DMSL(A)	19/06/1998
168003	58253	DMSL(B)	19/06/1998
168003	58453	MS	04/10/1998
168003	58653	MSL	19/06/1998
168004	58154	DMSL(A)	21/07/1998
168004	58254	DMSL(B)	21/07/1998
168004	58454	MS	21/07/1998
168004	58654	MSL	21/07/1998
168005	58155	DMSL(A)	17/08/1998
168005	58255	DMSL(B)	17/08/1998
168005	58455	MS	04/10/1998
168005	58655	MSL	17/08/1998
168106	58156	DMSL(A)	19/06/2000
168106	58256	DMSL(B)	19/06/2000
168106	58456	MS	09/08/2002
168106	58756	MSL	09/08/2002
168107	58157	DMSL(A)	14/07/2000
168107	58257	DMSL(B)	17/07/2000

Unit / Rake	Vehicle	Specific Type	Date Entered Service
168107	58457	MS	09/08/2002
168107	58757	MSL	09/08/2002
168108	58158	DMSL(A)	31/07/2000
168108	58258	DMSL(B)	31/07/2000
168108	58458	MS	24/07/2002
168109	58159	DMSL(A)	31/07/2000
168109	58259	DMSL(B)	31/07/2000
168109	58459	MS	26/07/2002
168110	58160	DMSL(A)	08/08/2000
168110	58260	DMSL(B)	08/08/2000
168110	58460	MS	24/07/2000
168214	58164	DMSL(A)	28/05/2003
168214	58264	DMSL(B)	28/05/2003
168214	58464	MS	08/06/2003
168215	58165	DMSL(A)	16/05/2003
168215	58265	DMSL(B)	16/05/2003
168215	58365	MS	28/04/2006
168215	58465	MS	28/04/2006
168216	58166	DMSL(A)	17/05/2003
168216	58266	DMSL(B)	17/05/2003
168216	58366	MS	28/04/2006
168216	58466	MS	28/04/2006
168217	58167	DMSL(A)	18/05/2003
168217	58267	DMSL(B)	18/05/2003
168217	58367	MS	28/04/2006
168217	58467	MS	28/04/2006
168218	58168	DMSL(A)	25/05/2004
168218	58268	DMSL(B)	25/05/2004
168218	58468	MS	25/05/2004
168219	58169	DMSL(A)	25/05/2004
168219	58269	DMSL(B)	25/05/2004
168219	58469	MS	25/05/2004

Heavy Maintenance

Activity	Commencement	Duration	Nature of activity	Responsible party
Bogie Overhaul	950,000 +0/-200,000 Miles with intermediate wheelset change	5 business days/unit		TOC
C6	7-8 years over lease duration	20 business days/unit	PB/VI3196 Issue 2 Revision A; April 2005	TOC

Modifications

Modification	Duration	Nature of activity	Responsible party
Base Offer			
Enhanced Offer			

Information not supplied

Any information not supplied because of a lack of availability must be listed here under the 'reasonable endeavour' clause of the competition commission's ruling.

- Max. acceleration
- Braking performance
- Axle loads
- Modification data
- Modification durations