

London Underground



'First and last' rail tour

Sunday 15 May 2011

MAYOR OF LONDON

Transport for London



Introduction

Welcome aboard! I would like to thank all of you for joining us for the day. We will shortly be underway on our '67 stock offline tour. The tour is being run to commemorate the end of the '67 stock and will raise money for the Railway Children charity.

Several have asked why 'first and last'? Certainly for me, and many of you, this is a 'first' opportunity to travel on a '67 stock train running over parts of the Underground other than the Victoria line.

The '67 stock was used many years ago on the Hainault loop of the Central line. Two rail tours were also operated offline some 32 years ago, before many of you were born!

Unlike the 1979 tours our route today is constrained by a number of factors. The choice of date was heavily influenced by the Underground's busy diary of closures to facilitate line upgrades and operation on the Central line was not an option because '67 stock is entirely incompatible with the Central line's new signalling system.

'Last' because this is definitely the last passenger trip made by a '67 stock offline before the fleet is withdrawn to make way for the new '09 stock trains. There is still a chance to ride '67 stock trains on the Victoria line over the next few weeks.

Several people have put in a lot of behind the scenes work to make the trip possible so at the risk of omitting anyone my thanks go to: Dave Brabham, Denise O'Connor, Gary Hatfield Geoff Rowe, Janette Palmer, Jasmine Anigbogu, John Heathcote, Mike Earley, Nigel Cobbe, Pat Dennis, Peter Neal, Sylvia Prince, Orchid Print and First Colour and not forgetting our drivers today and the volunteer stewards. Have a great day!

John Doyle
General Manager

Safety

The tour is an exciting and unusual event but railways have the potential to be dangerous places so please take care during the day and observe the following rules:

- Smoking is not allowed on any part of the Underground
- The consumption of alcohol is not permitted on the Underground
- Flash photography is not allowed on the Underground
- Please remain in public areas at all times
- Each car has a steward, please follow their instructions
- Rubbish bags are available on the train, please make use of them and avoid creating litter
- We are pleased to have several members of staff with us as guests today. If you are a member of staff, please remember it's your day off and you are a passenger for the day!

'67 stock



Three-quarter view of '67 stock train on the Victoria line.

Tube gauge Underground trains are known by the year of their introduction. The '67 stock was designed and built for the first new tube line in London since 1907. The Victoria line, opened on 1 September 1968, was the world's first automatically operated passenger railway. Now, after over 40 years service, the trains are the oldest tube trains in daily use on the Underground.

Thirty nine and a half trains were originally built to meet the needs of the line. The trains as built were finished externally in unpainted aluminum, a look which was to last until refurbishment of the fleet in 1989. To allow increased service on the line the fleet was enlarged to 43 trains at the time of refurbishment by the incorporation of redundant '72 stock cars.

Only nine trains are left in London, the others have been sent to Rotherham for scrap. Several components are being salvaged for use on other Underground trains, while the high price of scrap metal will see much of the trains reused.

Our route

- Seven Sisters – Northumberland Park depot
- Northumberland Park depot – Uxbridge (via Finsbury Park and Rayners Lane)

Lunch break at Uxbridge | 12:00 – 13:00

- Rayners Lane – Barons Court siding
- Barons Court siding – Ealing Broadway

Comfort break at Ealing Broadway | 14:30 – 15:00

- Ealing Broadway – Seven Sisters



Interior view of '67 stock.

Seven Sisters



Seven Sisters Underground station platform.

Our journey begins at Seven Sisters platform 4. This platform is normally used for trains terminating at Seven Sisters, but can also be used by through trains to Walthamstow.

Northumberland Park depot

The first leg of the journey is over a route normally used for trains running empty to and from the line's depot at Northumberland Park and by staff trains. Line speed is restricted to 22.5mph and the train operates under coded manual signaling. There will be a pause at the entrance to the depot while the train operator switches to restricted manual operation.

On conclusion of the upgrade the route from the depot to Seven Sisters will be signaled for bi-directional automatic working. This is necessary to provide the increased capacity to route trains to and from service in the time available at the start and end of traffic day.

Trains are driven in the depot at a speed of no more than 10mph under instruction from the depot control tower.

The depot maintains and services Victoria line trains. It has been enlarged over the years to accommodate the increased fleet and enhanced with facilities such as the under-floor wheel lathe. More recently the depot has been extensively upgraded to accommodate the new '09 stock trains.

To exploit the slightly larger tunnels of the Victoria line the new '09 stock trains have been built with a slightly larger loading gauge than other tube trains. As a result all of the new trains are being delivered from the Bombardier assembly plant in Derby by road.

Previously the Victoria line was signaled and controlled from a control centre shared with the Northern line at Cobourg Street near Euston. This year, as part of the line upgrade, operation was transferred to a new purpose built control centre, Osborne House, within the depot. The name 'Osborne' was selected as an oblique reference to Queen Victoria's association with Osborne house on the Isle of Wight.



Osborne House control room.

The train will come to rest at the staff platform on 60 road, one of two staff platforms in the depot. It will not be possible to alight here.

The train will return to Seven Sisters, pausing again at the depot outlet signal to switch back to coded manual operation.

Victoria line

The line was opened in four sections:

- March 1968: Walthamstow to Highbury & Islington
- December 1968: Extension to Warren Street
- March 1969: Extension to Victoria when the line was formally opened by the Queen
- July 1971: Extension to Brixton



The opening of the Victoria line at Green Park Underground station by Queen Elizabeth II.

Although when opened the line was designed for an annual usage of 50 million trips, in common with the rest of the Underground it is now busier than ever and carries as many as 180 million people a year (no wonder the trains are so crowded!).

Our trip along the line will be brief taking us as far as Finsbury Park. Here we will again pause for the transfer to the Piccadilly line. The crossovers were purpose built for the opening of the Victoria line and are used by engineering trains and to transfer '67 stock between the Victoria line and the rest of the network.

Piccadilly line

The first section of the Piccadilly line opened in 1906 as the Great Northern Piccadilly and Brompton railway from Finsbury Park to Hammersmith.

Having crossed over to the Piccadilly line we now follow the route taken by '67 stock trains on their last journey to the scrap yard. The trains travel under their own power to Acton where serviceable parts are recovered and they are loaded onto lowloaders for the journey to Rotherham.

Our train has been especially equipped with a trip cock to allow it to operate over conventionally signaled lines.

We come out into the open air between Earl's Court and Barons Court and continue our journey on the fast lines to Acton Town. On leaving Acton we join the Rayners Lane branch of the Piccadilly line to travel to Rayners Lane via Hangar Lane junction.



Interior of '67 stock with seated male passenger.

Metropolitan line

The original Metropolitan railway opened in 1863 between Paddington and Farringdon.

We join the Metropolitan line Uxbridge extension at Rayners Lane which was opened in 1904. We will pass through Metroland to our lunchtime stop at Uxbridge.

The line holds a record for the London Underground network – the longest distance between adjacent stations by rail is the 6.26 km (3.89 miles) between Chesham and Chalfont & Latimer.



Interior of the driver's cab of a '67 stock.



Moquette sample featuring same design as that used on the '67 stock refurbishment, c1993.

We will be making a prompt start, so if you leave the station please be back in time for the train departure. If you do unfortunately miss the train please make your way to catch us up and board again at Ealing Broadway by 14:30.

We again travel on the Metropolitan and Piccadilly lines to Acton Town where the train will be reversed via one of the sidings.

District line

We set off again and this time 'turn left' at Hangar Lane Junction to join the District line for the short journey to Ealing Broadway.

This stretch of the District line originally dates from 1879. Interchange is available with the Central line and mainline services from Paddington. There will be a comfort break at Ealing Broadway, again please be punctual in rejoining the train as there will be no chance to catch up if you miss it this time.

We rejoin the Victoria line at Finsbury Park and travel one stop to Seven Sisters where the tour concludes. To fit in with the busy schedule for service on the line we would ask you to leave the train as quickly as possible. After you have left the train it will work empty to the depot to be serviced and available for use in the week.



An interior view of refurbished '67 stock.

Memorabilia

Raffle tickets will be on sale for one of the train's special headboards. Tickets are available from stewards for £1 per strip.



'67 stock commemorative headboard.

Other items of memorabilia will also be available for sale during the lunch stop at Uxbridge. We hope to have available line diagrams as used on '67 stock trains, some '67 stock car numbers and rail tour posters.

As with ticket sales any money raised will be donated to the Railway Children charity.



Poster produced to promote 'First and last' tour.

The future

Victoria line passengers describe the line as 'fast and frequent' they also comment it is 'hot and crowded'! The Victoria line upgrade is all about addressing the latter of these two issues.

Reducing heat

As part of the 'cooling the tube' project, London Underground is upgrading the 13 ventilation shafts on the line by doubling the fan capacity; nine have been completed so far with four in progress. Local station cooling schemes are also to be implemented at several of the line's stations in forthcoming years.

The new '09 stock trains are currently braked using rheostatic brakes. When the last old train has left the line the changes to the electrical supply system will allow regenerative braking to be switched on. This will allow energy created during braking to be transformed into electricity fed back into the line and used by other trains.



New '09 stock train terminating at Brixton.

Although it wasn't possible to equip the new trains with air conditioning the forced air ventilation on the new trains will improve the passenger environment, especially when trains are stationary.

The combination of these measures will assist in providing passengers with the perception of a cooler environment.

Reducing crowding

A bigger fleet of 47 new '09 stock trains is being built. The new trains are more spacious than the old, very slightly longer, have no centre cabs and are built slightly larger to carry more people.



Interior of new '09 stock train.

The new trains are quicker than the old, they accelerate and brake at a faster rate and have a higher top speed of 50mph compared to the old trains. A new train can complete a round trip of the line in about 12% less time than the existing trains, roughly five minutes in each direction.

The new signaling system installed on the line and controlled from Osborne House provides more line capacity allowing trains to run closer together. We expect to increase the capacity of the line by about 21% and so reduce crowding.

The next steps of the upgrade:

- Complete delivery of the 47 new trains, scheduled for early autumn this year
- Taking the last '67 stock train out of service, scheduled for no later than 1 July
- Removing the original signaling system planned for spring 2012
- Increasing the off peak service taking advantage of the new train's capability in September of this year
- In the spring of 2012 it is intended to make the first incremental step of increasing the peak timetable

The Railway Children charity

Railway Children was founded in 1996 with the following objective:

'The relief of children and young persons under 25 years of age who are in conditions of need, hardship or distress, anywhere in the world and in particular those who are living on the streets'.



Since then Railway Children has worked with thousands of vulnerable children and young people living alone and at risk on the streets.

During the last year alone 25,076 children and young people living in UK, India, Tanzania and Kenya have benefitted from our work. In addition over 38,000 children in the UK have been supported through a prevention programme delivered in schools.

Railway Children focuses its work specifically on the relief of children and young people living alone and at risk on the streets in need of care and protection.



Historical images courtesy of the London Transport Museum.

VICTORIA, PICCADILLY, DISTRICT AND METROPOLITAN LINES

FAREWELL TO '67 TUBE STOCK TOUR

SUNDAY, 15th MAY 2011

In connection with the phasing out of 1967 Tube Stock on the Victoria Line, London Underground is running a train for special ticket holders only, between Northumberland Park Depot, Uxbridge and Ealing Broadway. **Train 767**, composed of 8 cars of 1967 Tube Stock, fitted with tripcocks, will run on the above date in the timings shown below:-

Train No.	767		767
Northumberland Park Depot	dep 09 56	Uxbridge (p/m 3)	dep 13 11
No. 52 Reception Road		Hillingdon	13/14
Seven Sisters (p/m 4)	arr 10 06½	Ruislip IMR	13/17
	ENTRAIN	Ruislip	13/19
Seven Sisters (p/m 4)	dep 10 13	Rayners Lane	13/25½
Northumberland Park Depot		South Harrow	13/28½
No. 53 Reception Road		Alperton	13/36
Staff Platform	arr 10 22½	North Ealing	13/40½
	dep 10 27	Ealing Common	13/43
No. 53 Reception Road		Acton Town (p/m 4)	13h50
Seven Sisters (p/m 5)	dep 10a37½		DETRAIN
Finsbury Park	10/43		Reverse via 21 Road
Via No. 10 crossover to Piccadilly Line			ENTRAIN
King's Cross	10/51	Acton Town (p/m 1)	14 15½
Holborn	10/54½	Ealing Common	14/17½
Green Park	11/00½	Ealing Broadway	arr 14 23½
Hyde Park Corner	11/02½	(p/m 7)	dep 15 08½
Knightsbridge	11/04	Ealing Common	15/11½
Earl's Court	11/10	Acton Town (p/m 4)	15d16½
Hammersmith (p/m 2)	11/15	Hammersmith (p/m 3)	15 23
Acton Town (p/m 1)	11a22½	Earl's Court	15/28
Ealing Common	11/24½	Hyde Park Corner	15/35½
Alperton	11/31	Green Park	15/38
South Harrow	11/38½	Holborn	15/44
Rayners Lane	11/42	King's Cross	15/48
Ruislip	11/48	Arsenal	15/54
Ruislip IMR	11/49		Via No. 3 crossover to Victoria Line
Hillingdon	11/52½	Finsbury Park	15/56
Uxbridge (p/m. 3)	arr 11 56	Seven Sisters (p/m. 4)	arr 16 00½
	LUNCH		DETRAIN
		Seven Sisters (p/m. 4)	dep 16 05½
		No. 52 Reception Road	
		Northumberland Park Depot	Arr 16 15



1967 Tube Stock

Victoria line



Built by Metro-Cammell, Birmingham 1967 – 1969

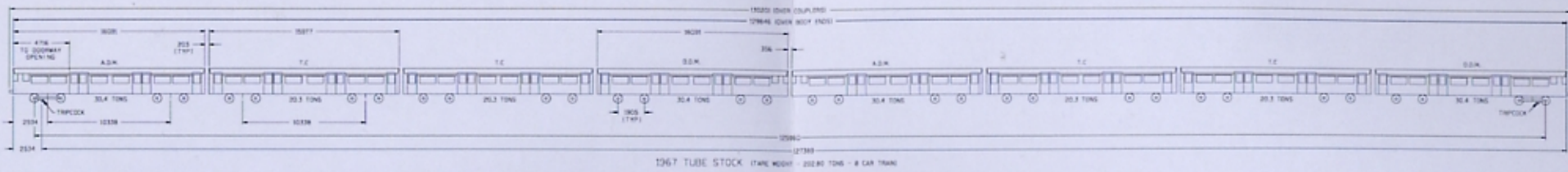
Entered service Victoria line 1968-1971

Refurbished by Tickford Rail Limited at Rosyth Royal Dockyard 1991-1995

Maintained by: Metronet Rail BCV Ltd

Principal characteristics

Track gauge:	4ft 8½ ins/1435mm
Current system:	630V dc 3rd and 4th rail, floating earth
Types of vehicle:	Driving Motor (DM); Trailer (T)
Formation per unit:	Four cars, formed DM – T – T – DM
Formation per train:	Eight cars, formed DM – T – T – DM + DM – T – T – DM
Number of train:	43 Eight-car trains.
Operation:	One person operated. Doors operating by train operator in the leading cab. Automatic train operation (A.T.O.). Manual driving (coded manual or slow manual). Some cabs (including all ex-1972Mkl DM cars) are no longer fitted with full ATC equipment and have been downgraded to 'middle motor' status. These can be used for shunting in the depots.



Vehicle details and statistics

	Driving Motor Car	Trailer Car
Length over body ends:	52ft 9ins	52ft 5ins
Width of body:	8ft 8ins	8ft 8ins
Car height:	9ft 5 1/4ins	9ft 5 1/4ins
Tare weight	30.4 tons	20.3 tons
Tare weight of 8-car train:	202.80 tons	
Passenger door open width (double):	4ft 6ins	4ft 6ins
(single):	2ft 3ins	2ft 3ins
Car number series:	3001-3086	4001-4086
	3101-3186	4101-4186
Vehicles in stock:	172	172
Grand total in stock	344	

It should be noted that 28 cars (14 driving motors and 14 trailers) were converted in 1987-1989 from Northern line crew-operated 1972 MKI tube stock. A further 3 cars (2 driving motors and 1 trailer) were converted in 1995-1999.

Passenger accomodation:

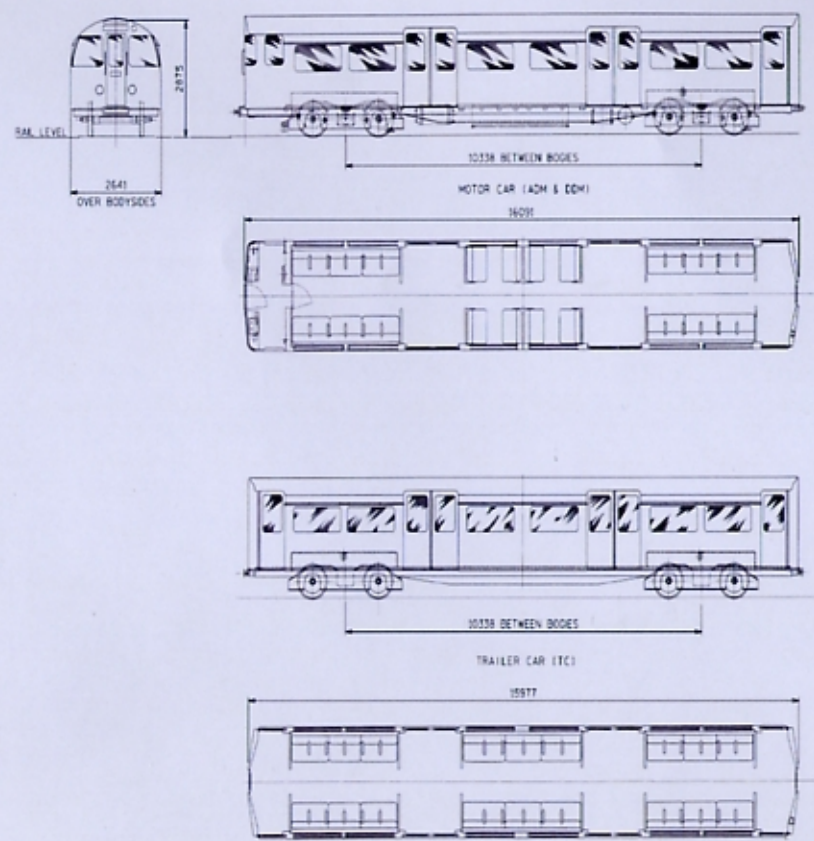
Please note that standing capacity figures exclude seating capacity

Seating capacity: (Number of seats per train)	304
Standing capacities: Floor area available for standing passengers (m ²) ^a	132.24
Maximum observed standing capacity (5 customers per m ²)	661
Maximum full load standing capacity (6 customers per m ²) ^b	793
Theoretical crush standing capacity (7 customers per m ²) ^c	926

NOTES:

- a) Capacities here are figures **calculated** from floor area for design purposes
- b) For propulsion performance rating
- c) For structural and braking capacity

1967 TUBE STOCK - Victoria Line



Equipment details

- Bodies:** Welded steel underframe riveted aluminium frame and unpainted aluminium alloy panelling. Exterior painted on refurbishment in LUL corporate red, white
- Bogies:** 4-wheel symmetrical plate frame bogies of welded/riveted construction. Wheel diameter – 2ft 6 ins.
- Couplers:** London Underground Automatic Wedglock between units, semi-permanent tray between cars within a unit.
- Traction system:** A.E.I. Traction pneumatic single camshaft, resistance controller with series/parallel grouping and 2 stages of weak field. Crompton Parkinson Brush LTI 15 axle-hung, nose-suspended motors, 16/65 gear ratio, 4 per driving motor car, 1 per driving axle, the two motors on each bogie are connected in permanent series.
- Compressors:** Reavell TBC38Z (reciprocating), 1 on each trailer.
- Brakes:** Rheostatic on Driving Motor cars. 1 air-operated brake block per wheel on all cars. Service braking – Rheostatic and staged e.p. with mercury retarders Note that the rheostatic brake does all the braking at low brake rate and low passenger load. As the rate and/or load increase, trailer (air) brakes are applied, then motor (air) brakes. Emergency braking – e.p. and Westinghouse automatic air brake. Parking brake – Automatic spring-applied, air released.
- A.T.O.:** John Kent driver box controlled by discrete track command spots.
- A.T.P.:** Westinghouse safety box controlled by mechanical governor and coded track circuits.
- Auxiliary power supplies:** One A.E.I Traction Motor- Alternator-Rectifier (type MG3005 & MG3007), one per trailer car.
- Main lighting:** 115V ac Fluorescent tubes – 12x5ft, 4x4ft, 4x2ft and 4x'D' tubes (2x2ft and 2x'D' tubes less on driving motor cars). All are inverter driven and fed by a 115V ac supply.



2009 Tube Stock

Victoria line



Built by Bombardier Transportation UK, Derby 2007-2011

Due to enter service in 2009 - 2012

Maintained by : LUL Nominee Company BCV

Principal characteristics

Track gauge:	1435mm
Current system:	630v dc 3rd and 4th rail, shoe gear fitted to A and D cars
Types of vehicle:	A(I) : Driving Motor car (DM) B : Trailer car (T) C : Non Driving Motor car (NDM) D(I) : Uncoupling Non Driving Motor car (UNDM)
Formation per unit:	A(I) car – B car – C car – D(I) car
Formation per train (8):	A – B – C – D + DI – C – B – A I
Number of trains:	47 eight car.
Operation:	One Person Operated (OPO) Automatic Train Operation (ATO) Manual Driving (Protected Manual or Restricted Manual)



Vehicle details and statistics				
	DM 'A'	Trailer 'B'	NDM 'C'	UNDM 'D'
Length over body ends:	16595mm	16345mm	16345mm	16345mm
Width of body:	2616mm	2616mm	2616mm	2616mm
Car height:	2883mm	2883mm	2883mm	2883mm
Tare weight	27.1 tonnes	21.6 tonnes	23.8 tonnes	25.8 tonnes
Tare weight of 8-car train:	197.3 tonnes			
Passenger door open width (double)	1600mm	1600mm	1600mm	1600mm
Passenger door open width (single)	800mm	800mm	800mm	800mm
Car number series:	11001-11094	12001-12094	13001-13094	14001-14094
	Odd nos. are South End facing (A-B-C-D) Even nos. are North Facing (A1-B-C-D1)			
Vehicles in stock:	94	94	94	94
Grand total in stock	376			

Passenger accommodation:

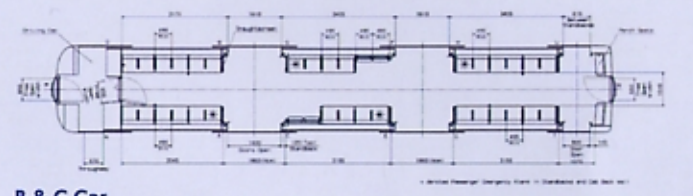
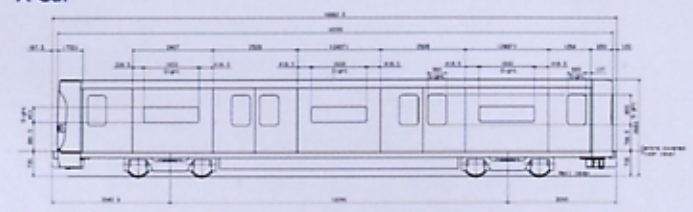
Please note that standing capacity figures exclude seating capacity

Seating capacity: (Number of full seats per train)	252
Seating capacity :(Number of tip up seats, excluding wheelchair spaces)	24
Wheelchair spaces/ additional tip up seats	4/12
Standing capacities: Doorway	130.0
Throughway (m ²)	23.2
Maximum observed standing capacity (5 customers per m ²)	734
Maximum full load standing capacity (6 customers per m ²)	876
Theoretical crush standing capacity (7 customers per m ²)	1028
Theoretical design crush standing (E6325 A2)	1174

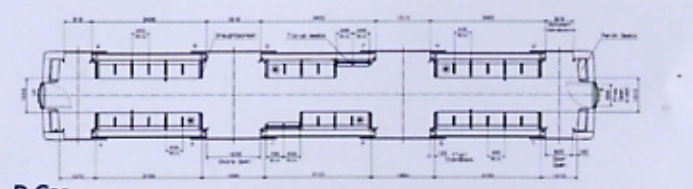
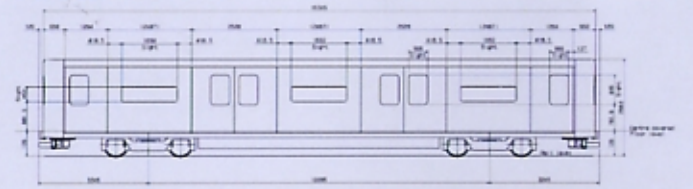
NOTES:

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- For propulsion performance rating
- For structural and braking capacity (and JTC)

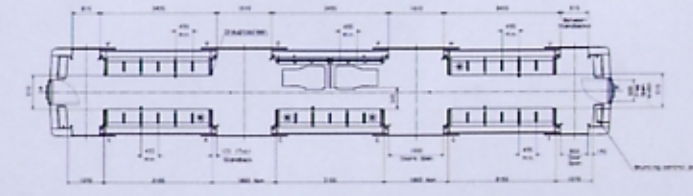
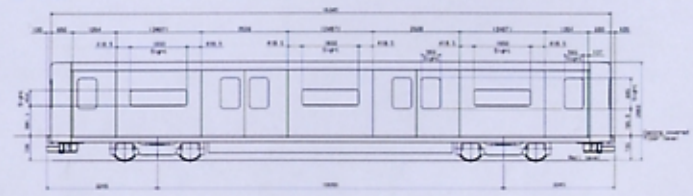
A Car



B & C Car



D Car



Equipment details

Bodies:	Aluminium extrusions welded and huckbolted (FICAS Technology).
Bogies:	BTUK Flexible frame.
Couplers:	Wedglock with pneumatic connections only on the A and A1 cars, swing bolt bar coupler between D and D1 cars, bolted bar coupler flange at all other positions.
Traction System:	Bombardier 3 phase AC, 75% motored. 24 motors, each rated at 75KW with Regenerative and Rheostatic braking.
Compressors:	Knorr-Bremse VVI 20T oil free reciprocating – 3 Phase AC Motor.
Brakes:	Knorr-Bremse EP2002 with PEC7 actuators.
ATO:	Westinghouse DTG-R (Distance to go - radiol).
ATP:	Radio transmission based system, Westinghouse, DTG-R.
Auxiliary power Supplies:	Bombardier static converter, one per four car unit, on the B cars. 110V dc control system with 102V 200Ah DC battery on the B cars.
Saloon lighting:	19 (A cars) or 22 (B/C/D cars) (including emergency lighting) fluorescent T5 Tubes via individual inverters per car.
Emergency lighting:	7 (A cars) or 9 (B/C/D cars) battery-fed fluorescent T5 Tubes via individual inverters per car normally forming part of the main saloon lighting.
Ventilation:	Saloon forced ventilation system that consists of six side mounted ducting systems to take the exterior air to air grilles mounted at head height. Dedicated cab air conditioning.
Passenger Information:	An LED external facing front destination display with separate train number display per train front. One external platform facing destination LED display per vehicle side. Six internal side facing Saloon LED displays per car.
CCTV:	OPO TTCCTV displayed on 2 monitors in cab via microwave transmission. Saloon CCTV system viewable in cab when stationary and recorded digitally.
Doors:	Six electrically operated sliding doors per side, externally hung and configured as two double doorways and two single door ways. Fitted with obstacle detection and sensitive edge plus threshold lighting when doors are open.

