



Department
for Transport

Rail Vehicle Accessibility: Exemption application

London Underground Limited: Central Line

Moving Britain Ahead

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Foreword

The Rail Vehicle Accessibility (Non-Interoperable Rail System) Regulations 2010 (RVAR) set standards for the accessibility features of a rail vehicle operated on particular types of rail systems. The Secretary of State has powers under section 183 of the Equality Act 2010 to allow operators of regulated rail vehicles to continue to operate a vehicle if it does not fully comply with the standards set in the Schedules to RVAR 2010.

This consultation contains the application from London Underground Limited for exemption from standards set out in Schedule 1, Part 1 (General Requirements) and Part 2 (Additional requirements) RVAR 2010 for trains operated on the Central Line, known as '92TS'.

The consultation period shall run until 31 October 2019. To share your views and comments on the application please contact us at: RailVehicleAccess@dft.gov.uk or write to us at

Central Line RVAR consultation
Rolling Stock Team
Department for Transport
Great Minster House
33 Horseferry Road
London SW1P 4DR

1. Exemption application

1 Full name of applicant and address

London Underground Limited
55 Broadway,
London,
SW1H 0BD

2 Description of Rail Vehicles

Central line 1992 Tube Stock - Vehicle numbers:

Train Formation: 85 trains consisting of 340 2 car units, four of which are coupled together to form an 8-car train.

Car Numbers:

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| Driving Motor Cars (A): | 91001 – 91349 (odd numbers) | 175 vehicles |
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| | 92402 – 92464 (even numbers) | 340 vehicles |
| Non Driving Motor Car (C/D): | 93002 – 93266 (even numbers) | |
| | 93402 – 93464 (even numbers) | 165 vehicles |
| Total: | | 680 vehicles |

3 Circumstances in which exemptions are to apply

At all times in passenger service, when a refurbished 92TS train stops at a platform where:

there is no step-free route from the platform out of the station: or

there is no step-free route between that platform and platforms for other London Underground (LU) lines or national rail services: or

it is not physically possible to:

bring the dimensions of the step and/or gap within the maximum permitted tolerances and

deploy a manual boarding ramp in a safe and appropriate way.

4 Relevant requirements from which exemption is sought

Schedule 1, Part 1 (General Requirements), of the Rail Vehicles Accessibility Regulations (RVAR) 2010, paragraph 1:

1(1) Subject to sub-paragraph (2), when a wheelchair-compatible doorway in a rail vehicle is open at a platform at a station, or at a stop, a boarding device must be fitted by the operator between that doorway and the platform, or the stop, if a disabled person in a wheelchair wishes to use that doorway.

1(2) Sub-paragraph (1) does not apply where the gap between the edge of the door sill of the wheelchair-compatible doorway and the platform, or stop, is not more than 75 millimetres measured horizontally and not more than 50 millimetres measured vertically.

5 Technical, economic and operational reasons why exemption is sought

Temporary exemptions are being requested so that the installation of manual boarding ramps is aligned with the refurbishment of the trains which delivers wheelchair bays. The train fleet will comply with the requirements of RVAR once complete, except where derogations are being sought.

Exemptions are also being requested under the Pimlico Principle at a number of locations as there are no possible step free journeys at those locations. This takes precedent from the pragmatic approach to Pimlico station which does not have any access to platform level or interchange by step free routes. If the Platform Train Interface (PTI) was made compliant, passengers would still be unable to leave the platform to make onward journeys. As such, until the stations have step free routes, exemptions are being requested. Full lists of platforms for which exemptions are being requested are in Section 11 and 12.

Our aim is to provide a 'turn up and go' service which allows customers the greatest level of access without the need for staff intervention and assistance. However, this is not always possible as many of the platforms were never designed to provide step free and level access. These stations are often difficult to alter due to their physical layout and modifications are constrained as many are below ground in Central London. The cost to make some stations, particularly in Central London, step free is prohibitively expensive, technically challenging and would cause significant disruption to users in both the station and surroundings.

Where step free is possible LU prefers the use of a permanent solution to that of a temporary solution, for example a manual boarding ramp (MBR). The configuration of the doors on the Central line trains prevents a permanent solution from being utilised. The doors are externally hung with the bottom runner below the floor level of the train. As such, no infrastructure works are possible to achieve the required compliant step and gap because of the runners and mechanism. If the gap is reduced between the train and platform edge it will start to infringe into the movement envelope of the train which would create the risk of the train striking the platform.

Engineers have examined a number of possible solutions however none were able to make a compliant PTI without introducing subsequent risks, such as trip hazards. Given the constraints, the closest that a Central line train could be to a platform with level access (through installation of a platform hump) would be 140mm, almost twice what is required by RVAR. This gap is often smaller this at many Central line platforms as the train 'over sails' the platform. This results in a smaller horizontal gap but a significant step is introduced. Please see Figure 1 which visualises extreme examples of these.

It has therefore been decided that until the trains are replaced on the Central line, MBRs will be used at all step free locations.

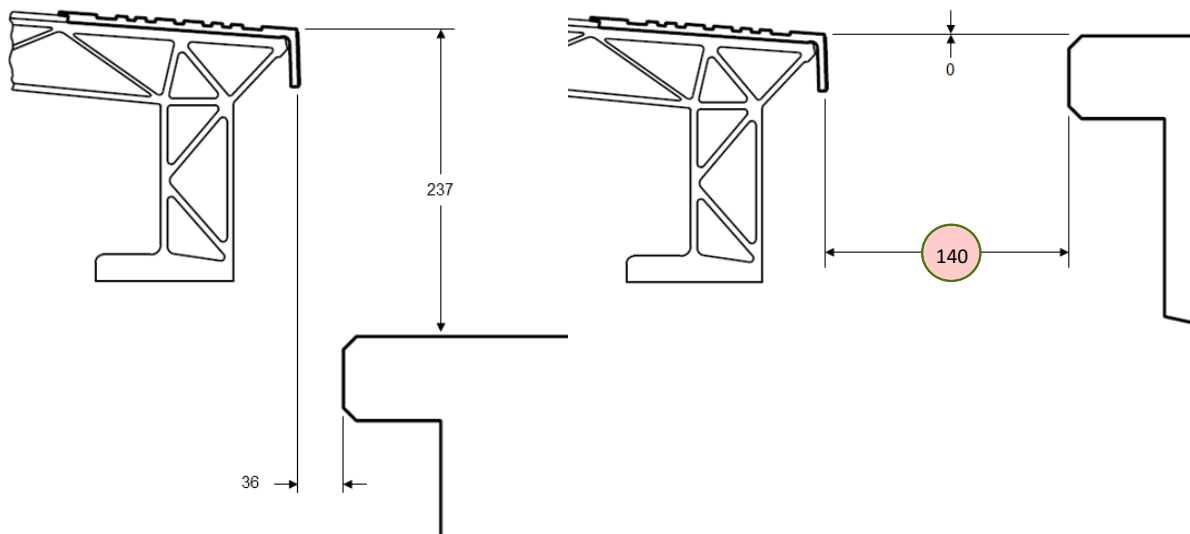


Figure 1. Platform configurations; No platform 'hump' left, and with right.

6 The effect which non-compliance would have on a disabled person's ability to use rail vehicles of the description to which the application relates

London Underground has sought to minimise the effect of these exemptions on peoples' ability to travel. By utilising MBRs a person with restricted mobility will be unable to make fully independent journeys on the Central line as staff will be required to deploy a ramp. Assistance however is available on a 'turn up and go' basis meaning that delays to a journey are minimised as much as practical and do not need to be planned in advance.

7 Any measures which could be taken to enable disabled persons to use the rail

vehicle if exemption sought is granted

A number of stations on the Central line have been opened up to people with restricted mobility by providing interchange with the Elizabeth line. The Mayor has committed £200m to step free works which will further improve access to the Underground network over the next five years.

8 Any proposals for later modification of rail vehicles to secure compliance with RVAR within a stated period

At stations where compliance is planned (Section 11), the temporary exemptions will enable LU to carry out works in parallel with the train refurbishment programme. Manual boarding ramps will provide an appropriate, accessible and sustainable solution to give greater access for customers at these stations.

LU has not applied for a permanent exemption for platforms where compliance is not currently possible as we are aware that technology and circumstances change. Consideration of future compliance and methods will be a factor for the introduction of new trains on the line. A list of platforms for which exemption is requested under the Pimlico Principle is in Section 12.

9 Supplementary information for consideration

A list of compliant platforms is available in Section 10.

10 Unless permanent exemption sought, the period during which exemption is to apply.

LU is requesting timed and untimed exemptions in line with the tables below with outlined timescales.

Timed exemptions

All listed as 'by December 2020' will be delivered in parallel to fleet refurbishment. All others are to be delivered under the Step Free Access Programme.

| Station | Platforms | Works | Completion date |
|----------------|-----------|-------|------------------|
| South Woodford | 1, 2 | MBR | August 2019 |
| Debden | 1, 2 | MBR | March 2020 |
| Hanger Lane | 1, 2 | MBR | March 2020 |
| Snaresbrook | 1, 2 | MBR | March 2022 |
| Bank | 5, 6 | MBR | by December 2022 |
| Leytonstone | 1, 2 | MBR | by December 2020 |
| West Ruislip | 1, 2 | MBR | by December 2020 |

| | | | |
|------------|------|-----|------------------|
| White City | 3, 4 | MBR | by December 2020 |
| Woodford | 2, 3 | MBR | by December 2020 |

Untimed Exemption Requests Under The Pimlico Principle.

| Station | Platforms | Station | Platforms |
|------------------|------------|-------------------|-----------|
| Barkingside | 1 | North Acton | 1, 2, 3 |
| Bethnal Green | 1, 2 | Notting Hill Gate | 3, 4 |
| Chancery Lane | 1, 2 | Oxford Circus | 1, 2 |
| Chigwell | 1, 2 | Perivale | 1, 2 |
| East Acton | 1, 2 | Queensway | 1, 2 |
| Fairlop | 1, 2 | Redbridge | 1, 2 |
| Gants Hill | 1, 2 | Shepherd's Bush | 1, 2 |
| Grange Hill | 1, 2 | South Ruislip | 1, 2 |
| Holborn | 1, 2 | St. Paul's | 1, 2 |
| Holland Park | 1, 2 | Stratford | 3* |
| Lancaster Gate | 1, 2 | Theydon Bois | 1 |
| Leyton | 1, 2 | Wanstead | 1, 2 |
| Liverpool Street | 4, 5 | West Acton | 1, 2 |
| Loughton | 1, 2, 3, 4 | White City | 1, 2 |
| Marble Arch | 1, 2 | | |

* Whilst platform 3 at Stratford is not step free, 3A is step free (via manual boarding ramp) and serves the same train operating in the direction at all times. 3A is on the opposite side of the train and doors open both sides when the train is in the station.

3A was an addition for the 2012 games to allow step free access.

Compliant platforms

| Station | Platforms | Station | Plat |
|-----------------|-----------|----------------------|------|
| Barkingside | 2 | Mile End | 1, 4 |
| Bond Street | 1, 2 | Northolt | 1, 2 |
| Buckhurst Hill | 1, 2 | Newbury Park | 1, 2 |
| Ealing Broadway | 5, 6 | Roding Valley | 1, 2 |
| Epping | 1, 2 | Stratford | 3A, |
| Greenford | 1, 3 | Theydon Bois | 2 |
| Hainault | 1, 2, 3 | Tottenham Court Road | 1, 2 |
| Leytonstone | 3 | Woodford | |

11 Full name of applicant and address

London Underground Limited
55 Broadway,
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12 Description of Rail Vehicles

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Car Numbers:

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| | 93402 – 93464 (even numbers) | 165 vehicles |
| Total: | | 680 vehicles |

13 Circumstances in which exemptions are to apply

At all times while the train is in passenger service

14 Relevant requirements from which exemption is sought

Schedule 1, Part 1 (General Requirements), of the Rail Vehicles Accessibility Regulations (RVAR) 2010, paragraph 10:

10 (1) Subject to sub-paragraphs (2) and (3), a handrail must be fitted in the following positions—

(a) in every rail vehicle, on the inside as close as practicable to, and on either side of, the passenger doorways in the side of the vehicle, extending vertically from a point not more than 700 millimetres above the floor to a point not less than 1200 millimetres above the floor;

10 (6) The requirements referred to in sub-paragraph (5) are that—

(c) there must be not less than 40 millimetres clearance for a passenger's hand between any part of the handrail and any other part of the rail vehicle, excluding the mountings of the handrail to the vehicle.

15 Technical, economic and operational reasons why exemption is sought

Paragraph 10 (1) a: Handrails in doorways

The handrails adjacent to the doorways on the 92TS technically comply with RVAR however that the usable height as measured by the DfT is between 660mm and 1135mm from floor height. The total measurement of the handrail as fitted to the 92TS is between 610mm and 1360mm high. RVAR states that a handrail must be between 700mm and 1200mm from floor height. LU understands that the usable height does not take into account the radius of the handrails at both ends.

Whilst it would be possible to replace the handrail in all door positions, LU believes it would be uneconomical when weighed up against the benefit that this would bring to customers. Following discussion of this matter with the DfT on 24 September 2015 it was agreed that feasibility work should cease on economic grounds of changing the hand rails given the benefit it would give to customers. Figure 2 shows the hand rails in question with height measurement taken from the floor level of the train.

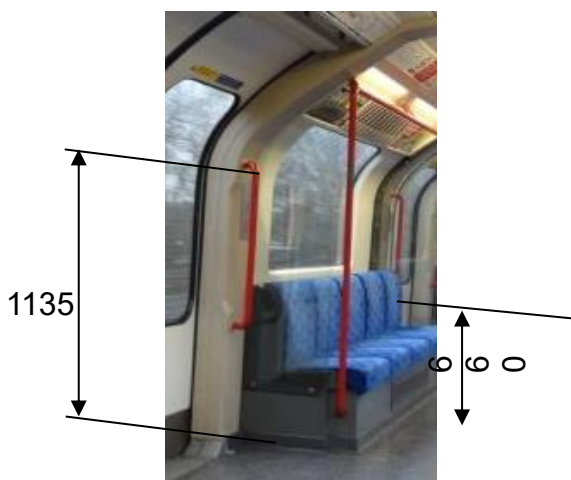


Figure 2. Handrail height useable height

Paragraph 10 (6) c: Clearance for oval handrails

Owing to the dimensions of the Central line vehicles, an oval handrail was fitted above the doorways. This allows for significantly more space to hold on when the train is moving than if they were not fitted. It is assumed that at the time of construction, this profile was chosen so as not to impede on the space above the doorways which may have led to a risk of a person striking their head whilst boarding or alighting a train. The current hand rail follows the shape of the interior bodywork of the train which would have had a protrusion if the handrail had a circular profile.

The current handrail is compliant in size with RVAR however the clearance between the top of the hand rail and the bodywork is 35mm and not the required 40mm. In order to comply with this requirement, the handrail would introduce a hazard in the already restricted head height above the door. As such, LU cannot recommend adjusting the handrails.

London Underground also believes that there is little benefit provided by moving the handrail 5mm and any work which could take place to adjust the location of the handrails would also not represent good value to customers. This was discussed with the DfT during the meeting on 24 September 2015 and it was agreed that feasibility work on this element should cease on economic grounds. It is not thought that passenger benefit would increase for the cost of modification.

16 **The effect which non-compliance would have on a disabled person's ability to use rail vehicles of the description to which the application relates**

London Underground does not believe that there is detriment to any customers' use of the train due to the clearance of the handrail.

17 **Any measures which could be taken to enable disabled persons to use the rail vehicle if exemption sought is granted**

London Underground does not believe that there are any further measures which could be taken to address the handrails in the 92TS which are economic to carry out and provide value.

18 **Any proposals for later modification of rail vehicles to secure compliance with RVAR within a stated period**

There are currently no proposals for later modifications relating to these clauses.

19 **Supplementary information for consideration**

None

20 **Unless permanent exemption sought, the period during which exemption is to apply.**

A permanent exemption is sought.

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23 Circumstances in which exemptions are to apply

At all times while the train is in passenger service

24 Relevant requirements from which exemption is sought

Schedule 1, Part 1 (General Requirements), of the Rail Vehicles Accessibility Regulations (RVAR) 2010, paragraph 11(5):

11 (5) Whilst a rail vehicle is stationary at a station or stop any public address systems required to be fitted inside the vehicle, and on its exterior, must be used to announce the destination of the vehicle or, if it is following a circular route, the name or number of the route and, in the case of systems inside the vehicle only, to announce the next

stop.

25 Technical, economic and operational reasons why exemption is sought

London Underground is committed to providing sufficient timely, accurate and accessible customer information to enable our customers to be confident during their journey, make informed decisions and to minimise the impact of disruption.

London Underground is seeking a permanent exemption that would allow the removal of the 'next station' information inside the saloon whilst the train is stationary at a platform. It is believed that announcing the 'destination' information provides the same benefit to passengers whilst at a station. This is because the direction of travel can be ascertained from the destination, as routes are simple and maps available inside the train. Additionally the 'next station' and 'destination' announcement is made during the interstation run.

There is the concern that operation of the passenger service could be impeded in delivering all regulated information whilst stationary at a station. The dwell time is carefully balanced with run times in order to deliver the train service and delays whilst stationary can have knock on effects to service robustness and over crowding.

London Underground strongly believes that we can provide a better service to passengers by reducing the amount of regulated information given. This allows a driver to give additional information about service disruption, interchange with other transport modes or LU lines, step free access and where appropriate high-level local and tourist information. All regulated information will still be given inside the train between stations in audible and visual format once the new Passenger Information System is delivered as part of the train overhaul.

Passengers on the platform are able to get information from a range of sources including audible station announcements, platform 'next train' display indicators, visual displays on the external side of the vehicle and fixed signage such as network maps. Supplementing this are Platform Help Points which enable passengers to communicate directly with station staff for further information.

The Central line service operates at frequent headways and LU believe that the information provided is representative of the "spirit of RVAR" in its meaning; namely the direction of the train and destination where it is appropriate to give this information. Short run times between stations offers reassurance if a passenger is travelling in the wrong direction and frequent service allows for correction quickly and easily with the minimum disruption should this occur.

In applying for this exemption, LU will bring the Central line fleet into line with the more modern trains used on the network. The standardisation of messaging brings a consistency across London Underground and aids travellers with familiarity of the. During silent time during the dwell, the Train Operator or digitised announcer system can make announcements, where applicable, without detracting from the purpose of the regulated information.

26 Any proposals for later modification of rail vehicles to secure compliance with RVAR within a stated period

There are currently no proposals for later modifications relating to these clauses.

The effect which non-compliance would have on a disabled person's ability to use rail vehicles of the description to which the application relates

There is a possibility that passengers may board the wrong train as full information is not broadcast whilst the train is stationary. There are supplementary information sources which can be consulted to ensure that the chance of this happening is minimised before boarding the train.

27 Any measures which could be taken to enable disabled persons to use the rail vehicle if exemption sought is granted

London Underground periodically reviews all information which is broadcast to customers to ensure that it is appropriate and meaningful to provide the best customer experience. All station and train messages are examined during these reviews.

28 Supplementary information for consideration

Information given in this way is in line with other train fleets operating on London Underground.

29 Unless permanent exemption sought, the period during which exemption is to apply.

A permanent exemption is sought.

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32 Circumstances in which exemptions are to apply

At all times while the train is in passenger service

33 Relevant requirements from which exemption is sought

Schedule 1, Part 1 (General Requirements), of the Rail Vehicles Accessibility Regulations (RVAR) 2010, paragraph 13(3):

13 (3) Each priority seat, and the space available to its user, must comply with the specifications shown in diagram C1 and in either diagram C2, C3 or C4 in Schedule 2.

34 **Technical, economic and operational reasons why exemption is sought**

The priority seats in the 92TS are the same height as the rest of the seats in the saloon. This height is 410mm which is 20mm below the minimum RVAR stipulated height of 430mm. It would be technically possible to raise the seat height however London Underground has concerns that raising only one seat would have aesthetic disadvantages.

Though it is possible to raise the seat height across the whole fleet it is deemed to be of low benefit for the cost of changing the seating. This was discussed with the DfT during a meeting on 24 September 2015 and it was agreed that on economic ground there was little benefit to raising the seat height. Accordingly feasibility works ceased on this element of compliance. Figure 3 shows the priority seat at the end of the aisle with a consistent height with all other seating.



Figure 3. Priority Seating

The effect which non-compliance would have on a disabled person's ability to use rail vehicles of the description to which the application relates

A user in the priority seat is unlikely to be impacted by the seat height being 20mm lower than required in the regulation. All priority seating is next to a hand rail which can be used to aid standing and sitting.

35 **Any measures which could be taken to enable disabled persons to use the rail vehicle if exemption sought is granted**

There are no further measures which are economically deliverable which would deliver benefit to users.

36 **Any proposals for later modification of rail vehicles to secure compliance with RVAR within a stated period**

There are currently no proposals for later modifications relating to this clause.

37 Supplementary information for consideration

None

38 Unless permanent exemption sought, the period during which exemption is to apply.

A permanent exemption is sought.

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41 Circumstances in which exemptions are to apply

At all times while the train is in passenger service

42 Relevant requirements from which exemption is sought

Schedule 1, Part 1 (General Requirements), of the Rail Vehicles Accessibility Regulations (RVAR) 2010, paragraph 20:

20 (10) If a handrail is to be fitted to the ceiling of a rail vehicle, it may protrude into a

wheelchair space provided that—

- (a) subject to sub-paragraph (11), it must not do so by more than 250 millimetres measured from the passenger gangway side of that space; and
- (b) its height must be not less than 1500 millimetres measured vertically from the floor.

(11) In its application to a narrow width vehicle, sub-paragraph (10) (a) has effect as if for 250 millimetres there were substituted 400 millimetres.

43 Technical, economic and operational reasons why exemption is sought

During detailed design on the wheelchair spaces on the 92TS it became apparent that the handrail design within this area cannot comply with RVAR. The horizontal handrail above the wheelchair space, because of the existing mounting locations on the 92TS, will protrude 451mm into the space rather than the permitted 400mm. This is because the wheelchair space is being retro-fitted to the train which was initially built before RVAR was introduced. Figure 4 shows the dimensions and location of the handrail (coloured red) when viewed longitudinally through the train.

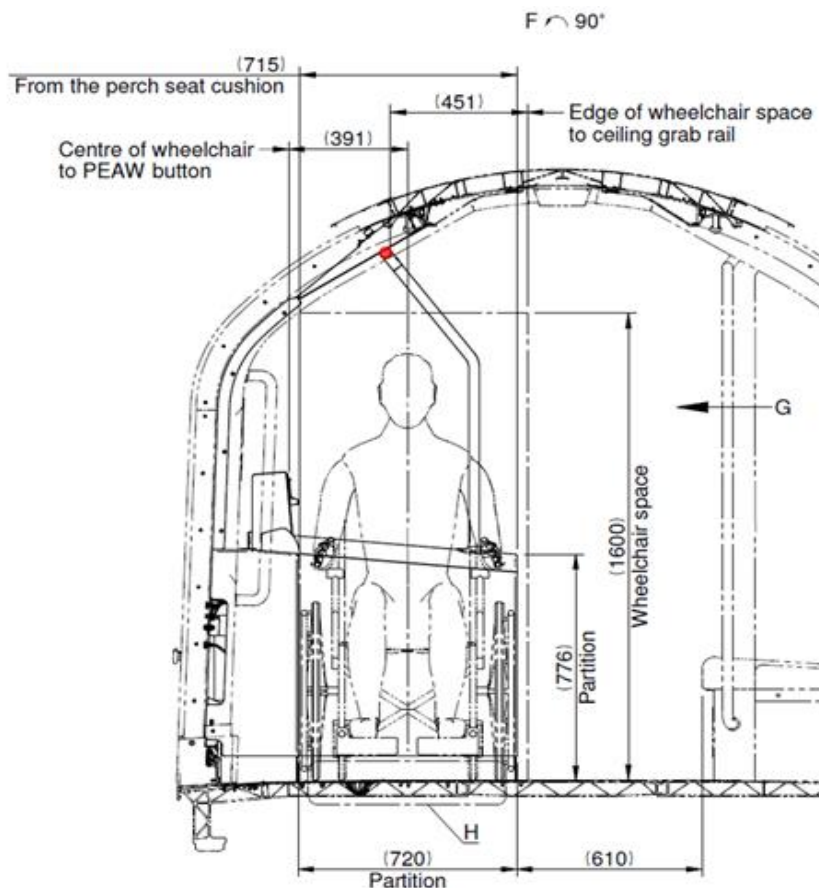


Figure 4. Wheelchair Space

The 92TS is considered a narrow width vehicle and has a low and curved roof line which limits the available space for hand rails. In order to move the handrail into a compliant location would mean that this would be mounted higher within the passenger saloon reducing its usability. It would also require a new mounting solution to be incorporated into the ceiling or an adaption of the existing mounting points. Figure 5 shows an enlarged view of the mounting point within the train body and

location of the rail with the mounting hardware excluded for clarity.

44

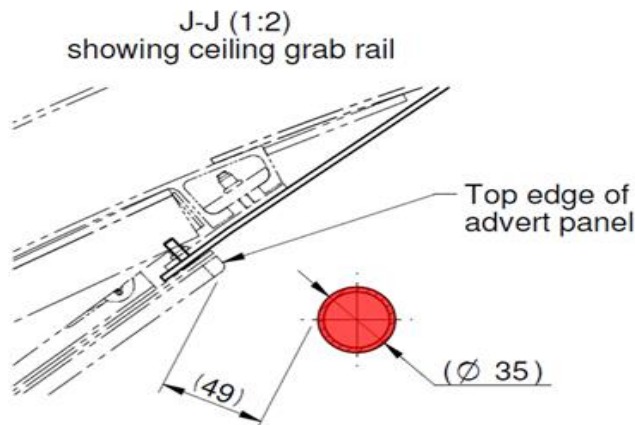


Figure 5. Mounting Location

There are five points across the top of the two wheelchair bays which the rail affixes to (see figure 6). The line of the existing handrail will be followed ensuring that the rail can be secured to existing mounting points within the train. This will ensure that the existing rail continues to be useable in future. The impact of removing this rail would mean that passengers have fewer places to hold on whilst the train is in motion, potentially leading to injuries.

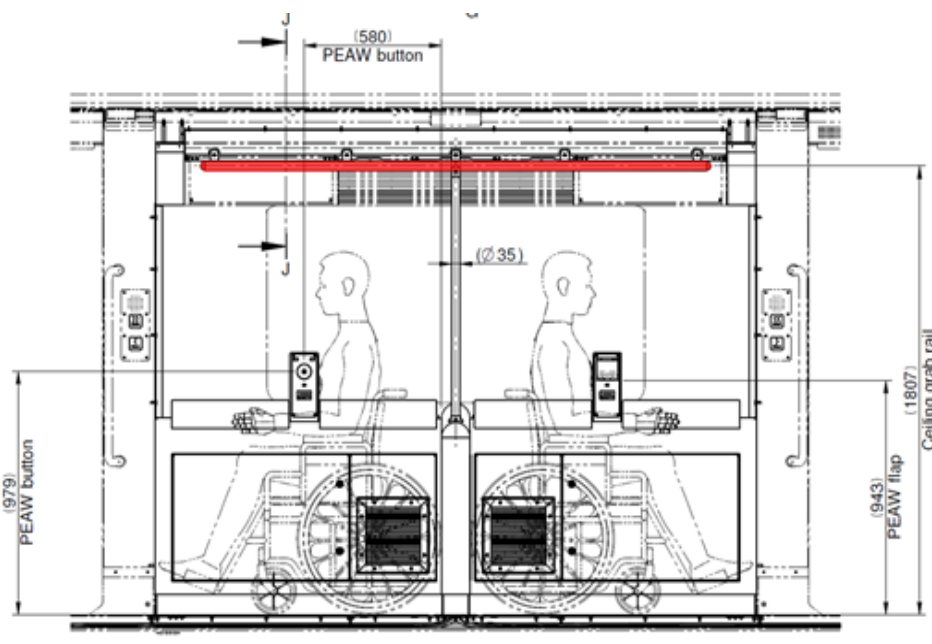


Figure 6 Wheelchair space locations

The effect which non-compliance would have on a disabled person's ability to use rail vehicles of the description to which the application relates

London Underground does not believe that there is detriment to any customers' use of the train due to the position of the handrail above the wheelchair spaces.

45 **Any measures which could be taken to enable disabled persons to use the rail**

vehicle if exemption sought is granted

London Underground does not believe that there are any further measures following design which could be taken to address the handrails in the 92TS which are economic to carry out and provide value.

46 Any proposals for later modification of rail vehicles to secure compliance with RVAR within a stated period

There are currently no proposals for later modifications relating to these clauses.

47 Supplementary information for consideration

None

48 Unless permanent exemption sought, the period during which exemption is to apply.

A permanent exemption is sought.