

IPEX's industry insights is a series of expert opinion thought leadership articles on issues on today's railways.

Power to the people

In this rapidly changing environment that we live in, the railways are sometimes seen as conservative. This is true and is a result of longevity. A multiple unit will be designed to last for 35 years. A lot can happen in 35 years. 35 years ago, it was 1982. Margaret Thatcher was in power; mobile phones were a dream; and there was no commercial internet. Most trains were still hauled by locomotives, there were still pick up goods trains, and the Advanced Passenger Train was the future. Fitting power sockets to trains never designed to charge an iPhone because that is what the passenger of today demands, is challenging. Current solutions to the challenge have not always been successful, and this paper examines what sockets, and where to fit them.



Longevity in the railways

The result of the longevity of the life of rolling stock on the railways is that often there is a need to "make do and mend". Unfortunately for the railways of Britain, privatisation took place in the midst of the technology revolution which almost certainly had, for a time, a detrimental effect on the acceptance of technology onto the railway systems.

The longevity of the railways is also caused by the planning process required, which can delay projects for many years. The much hailed Digital Railway is after all a rebranding of earlier schemes which have yet to be implemented. Thameslink 2000 may yet happen this year. This elongated planning can mean that by the time something is delivered, there is a whiff of obsolescence in the air, and the hailed benefits are a little left field of where they should be.

Powering up

One of the technology changes that has occurred from the rise in use of mobile phones and laptops is the need to recharge. Gone are the days when the phone in your pocket started the day on 90% battery life and finished on 80% even if you did indulge in a session of playing Snake. The laptop on the other hand has resolutely remained needing charging if more than a couple of hours work is to be done while connected to a communications signal.

This change in technology has required the addition of power supplies for passengers on trains.

Observations of passengers usage of electronic devices were made on long distance business / commuter trains (Newcastle and York to London), commuter / long distance (Trans-Pennine York to Leeds), and regional / country (Leeds to Carlisle to Newcastle).

This reveals that almost all passengers will use an electronic device on board a train. In all cases observed, the only passengers not using electronic devices regularly (i.e. for longer than sending a text message or making a call) were passengers estimated to be above the national retirement age.

It was also observed that the majority of electronic devices used were mobile phones and tablets. Laptop use is very much limited to business routes; the only passengers on non-business routes using laptops, were doing so to charge their phones as the train was without power facilities.

This then raises the question whether a standard 3 pin socket is necessary. The 3 pin socket is only standard for UK travellers and requires a bulky plug to connect to. Alternatively a USB socket is an international standard, and the plug is compact and slim. If the majority of passengers are using phones and tablets, then a USB socket would be a perfectly adequate solution.



In addition, the USB socket limits the draw on the hotel power and so multiple sockets can be provided without limiting the numbers to fewer than the numbers of seats. This resolves the current problem where a passenger could plug a pair of hair straightening tongs or similar into a socket which would create a disastrously high draw on the hotel power.

Northern Rail obviously believes this is the way forward and has been running a trial with one vehicle of a Cl.158 fitted with USB sockets for the past 12 months¹. In a meeting with Northern Rail, the engineering staff stated the trial was taking place because passengers had requested USB sockets. Similarly, some of the medium distance competing bus routes have also followed this path with “City Zap” between York and Leeds providing Wi-Fi and a USB socket for every seat.

Placement

The placement of sockets to date has been driven more by the retro-fitting of such sockets than by any view of usability. Additionally, the available “spare” auxiliary – or hotel – power that is available often means that two passengers have to share one socket, and if that is inconveniently located near the knees of the window side passenger, there ensues the “excuse me.., could you just.., I wasn’t stroking your knee...” awkward conversations. Even on trains that have been fitted with sockets from new, the socket placement is not always

well thought out. The Cl.185s on the Trans-Pennine route have the socket underneath the table surface, sufficiently hidden for many not to know they exist. Passengers can be observed walking through to the disabled area where two overt sockets are fitted to charge their phones.

Proposal

It is therefore proposed that a rethink in the power facilities that is provided on trains occurs before it is too late. We believe that more dedicated research should be undertaken to understand passenger requirements and also to understand the technology of power socket development so that appropriate future proofing can be taken. It is further propose that, apart from routes which see heavy business travel, 3-pin sockets should not be fitted to trains at all, but that USB sockets are used instead.

Sockets should be easily accessible, perhaps on the table next to the window, and behind tray tables in airline seats. Alternatively, sockets could be placed between the two seats as is common on airlines. Whatever solution is chosen, it should either be visually obvious to the passenger or signage provided at-seat to inform where it is. Commuter trains could additionally be fitted with USB sockets on the top of seat-backs, on the edge of luggage racks, or on grab-poles to enable standing passengers to charge phones too. These could be fitted with low friction sockets to enable the cables to be quickly pulled out in the event of an emergency.

Finally, it is proposed that the provision of wireless charging should be investigated as the increase in trailing leads on trains could become a safety issue in an evacuation scenario.



IPEX Consulting is a bespoke consultancy providing trains systems commercial engineering solutions across the global railway industry.



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¹ Class 158 number 158 096