

W CLASS TRAM MODIFICATION WORKING PARTY

Meeting 10am on Monday, 27 February 1989.

AGENDA

1. Need for program
2. Scope of modifications - Possibilities, Costs, Concept
3. Consideration of Proposed Modifications

Body

1. Lighting - fluorescent
2. Saloons, centre-section - similar to A class/W7
3. Windows - halfdrop, special glass, no blinds
4. Flooring - no slats - treadmaster type
5. Sand filling external
6. Heaters
7. Extra front door - 3 steps - door operation

Cabins

1. Bulkhead replacement
2. Driver's position and seat
3. Drivers controls and equipment - wipers, heaters, AVM.
4. Windscreens
5. Ventilation
6. Dot matrix destinations

Electrical

1. Static Inverter
2. Exterior lighting

Pantograph

1. Electric operation

Trucks

1. Brake actuators, slack adjusters, hand brake/parking brake.
2. Motors

Air System

1. Compressors
2. Governors

4. Other Business

"W" MODIFICATIONS.

17/11/88

Design changes to consider:

1. Driver's Cab
 - 1.1 New single, bi-fold door with hand rails. If possible the same Beclawat door, 24v door operator (Sigma) and step well, as used in the A's and LRVs will be used to minimize spares.
 - 1.2 New driver's seat, as used in LRV, offset from the centreline to driver's right.
 - 1.3 Retain remote controller, & Westinghouse air brake handle. Substitute existing hand brake and operating wheel by a hand (or foot) operated, spring applied, driver controllable parking brake. The parking brake will be incorporated in new brake actuators with slack adjusters (SAB?). The parking brake will be spring applied automatically if the air pressure falls below operating level and also be able to be applied and released by the Driver, to permit the tram to be driven back to the Depot if the air system becomes defective. The revised brake system may incorporate two actuators/slack adjusters/spring brake units per truck (SAB?), alternatively 4 per truck (depending on available space and available piston travel) and would eliminate the hand brake system, comprising hand wheels, rollers, brackets, cables, return spring, chain and levers and the brake cylinder, levers, pull rods, radius bars, radius bar supports and radius bar pull rods and end stops, as well as the wear and rattles related to these components.
 - 1.4 Destinations. Roller blind type to be replaced by dot matrix type. If space permits it is planned to use the same type (Gulton 6") as fitted to the MAN buses, with 8" route numbers in a modified route number box above the roof in the traditional location. It may also be possible to incorporate 6" side route numbers (not destinations) behind the lower, fixed pane in the window between the sliding doors.
 - 1.5 Incorporate windscreen washers, wipers, heater demisters, and mirrors using suitable components, common with the LRVs if possible.
 - 1.6 Provide twin high and low beam headlights, turn indicators, tail and stop lights and hazard warning lights, again using suitable common components.

- 1.7 Provide a Driver's panel, fitted with controls for the front and side doors, interior lighting, exterior lights and their reversing switch, turn indicators, compressor, destination and route numbers, parking brake, windscreen washers, windscreen wipers, heater demisters, passenger's and driver's heaters, an on/off switch for the static inverter, a driver's cabin light switch, transponder and airpressure test lights, and pantograph controls for raising and lowering. Panel to be protected by a lockable cover.
- 1.8 Provide run number mount and points bar sheath.
- 1.9 Provide Driver's half door.
- 1.10 Provide Driver's half drop window.
- 1.11 Provide Driver's windscreen and blinds.
- 1.12 Provide Fibreglass canopies, blending Driver's cabin roof with existing roof section and providing mountings for destination signs.
- 1.13 Provide Bumper with anti-climbers, to be maintained at standard height.
- 1.14 Provide steel cabin frame, to provide Driver protection and provide main frame stabilization, diminished by bulkhead removal. Frame to incorporate a bulkhead behind driver.
- 1.15 Provide dark glass to top of bulkhead behind driver?
- 1.16 Provide Crew security box.
- 1.17 Lifeguard gear to be retained.
- 1.18 Foot operated bells to be retained.
- 1.19 Foot operated sanding switch to be provided, if electric sand valves are used.
- 1.20 Provide carefully positioned rear vision mirrors and internal mirror.
- 1.21 Provide coat hooks.
- 1.22 Provide Driver's fan.
- 1.23 Provide forward opening fresh air scoops.

2. Windows

- 2.1 Fit Beclawat half drop windows in the 16 window spaces in the end saloons and Beclawat half-drop window (like modified W5s) between the sliding doors.

Window glass is to be safety glass or laminated glass with good infra-red filtering to reduce the heat load within the tram. No blinds are to be fitted, since centre sections of trams have never had them, nor have buses, nor trains since the ~~Tait's~~ *Harris*.

Window pans are to finish internally over laminex interior lining to eliminate dust collecting ledges.

Good ventilation should be provided by the half drop sashes, with airflow unimpeded by blinds.

3. Interior Lighting

24V fluorescent tubes for efficiency. (Long tubes for improved tube life?), positioned longitudinally in the line of existing lights, not flush but projecting below the ceiling to illuminate the ceiling for maximum interior illumination and best visibility of the tram from outside, at night. Battery operated emergency lighting over doorways.

4. Seating

Corner saloon twin seats to be replaced by single seats, like the A's, with sand hoppers within the seat surrounds and an inlet port for sand filling, incorporated in panel behind squab.

Other seat arrangements generally as for existing W7 saloons but using the seat design of the A's, with slightly reduced length of transverse seats to provide an adequate aisle width.

Centre section to be like a W7 or modified W5. Seat surrounds to be fitted to all seats.

Vinyl covered cotton is preferred for ease of adequate cleaning at minimum cost. If time has proved the cloth LRV seats to be suitable in service and maintaining appearance, cloth to be considered. Seats to be all fire retardent material.

5. Floor Covering

To be Treadmaster or Compocork. All floor slats to be removed.

6. Interior Lining

To be laminex or equivalent. Incorporate best fire retardence possible. Provide waste bins for used tickets.

7. Passenger Heaters

At least 4 of the "Z" type to be fitted within seat surrounds.

8. Static Inverter

To be fitted within a ~~seat~~ surround, above floor to protect from water. Associated maintenance free type "backup" batteries to be fitted below floor to disperse hydrogen and oxygen generated during charging.

9. Stanchions & Rails

Stainless Steel, diameter and location similar to A. Consider grab handles for passengers in centre doorway areas.

10. Passenger Stop Request

Leather bell cord plus 4 push buttons. Operation to be acknowledged to ~~passengers~~ by tone and lit sign, as for A's.

11. Sanding

Sanding ports to be provided in saloon side panels in same locations as for the A's, providing a uniform external sand filling system for all trams, eliminating sand spills within trams and facilitating mechanized sand box filling. *Seat glass*

12. MTA Information and Advertising

Provision is to be retained within the tram for display of route and fare information, plus advertising and for external advertising on the side panels.

13. Pantograph

Remove poles and hooks and stop bars and install pantograph.

14. Cabling

All cabling insulation to be fire retardent.

15. Noise Reduction

Remove compressor air inlet from tram interior to reduce noise level. Replace existing air filters with automotive type air cleaner (fitted with paper element) on a flexible tube, with the inlet pointing down.

16. External Appearance

Because the Driver's Cabin will be longer, and the Driver's position moved from the centreline, to the right, the external appearance of the cabin will inevitably be changed. However, an attempt should be made to retain as much of the appearance of the W type as possible or, if this is impractical, to provide an aesthetically pleasing design, suitable for machine washing.

H.S

Ref:M-16-11

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The Met.

File:
Ref: W-CLASS

DATE 12 August 1988

Metropolitan Transit Authority

Inter Office Memorandum

TO MANAGER, PRESTON WORKSHOPS
FROM A/GROUP MANAGER, FLEET MAINTENANCE AND CONSTRUCTION
SUBJECT MODIFICATION OF W CLASS TRAMS

My comments on this subject, which you requested recently, are as follows:

Comparing the later trams with W Class trams, from the point of view of the passengers and crew, one is compelled to recognise the need for improvement.

I consider the modifications discussed below to be those which would provide the best overall improvements for appropriate costs.

Because of their greater internal width, better lighting and lighter interior finish, the Z and A Class trams appear more spacious and provide better access. While it is unlikely that the W Class trams could be widened, the W7 layout achieves a more spacious effect than the W6, which has transverse seats in the centre section. I appreciate that it is more comfortable to sit "facing the engine" but the transverse seat arrangement, particularly in the middle section, inhibits access - with or without a conductor, and a conductor's job in the W7s appears easier to me.

Compared with later trams, the lighting of the Ws is dim and the lighting fixtures are hard to clean. They are usually not clean at present. Obviously, we now know "how to do it"; it's a matter of resource availability to improve lighting.

Seating is also uncomfortable, compared with later vehicles and needs to be improved to A Class standard.

The older interiors are not designed for easy cleaning and while the trams are often "macro-clean" because they've been swept, they are, at the same time, "micro-dirty", i.e. all the corners and ledges are very dusty, so any re-design should be easy to clean.

I do not think that carpets are the answer in trams, but Treadmaster has withstood some 15 years of service. Floors need to be easily swept and the wooden floor slats still fitted to some trams need to be eliminated to assist cleaning, along the lines of the W5 modifications done in recent years.

While it is not easy to change the very high steps, some years ago Doug Lees designed new "fronts", incorporating a much improved driving position and an additional single front entrance, which could improve access for the aged and disabled. A few seats would be lost in the end saloons, but there would be an advantage overall to both passengers and crew. A new front could well be designed so that machine washing would be made more effective.

Curtain type destinations are now obsolete for many reasons and it may be possible to incorporate the matrix type destinations fitted to our new MAN buses. This would eliminate the need to change curtains continually and make the interchange of trams between Depots much easier, eliminating the present need to change destination boxes. Matrix destination and route number setting should also assist crews.

Sand for braking is a necessity; its provision is labour intensive and, with W trams, frequently distributes sand on the vehicle floor. There is a need to review the method of sand distribution within the sheds and to re-design the sand entry into the trams so that a hose filling technique can be implemented.

The current brake adjustment frequency may be improved if slack adjusters — be incorporated and motor life and reliability would benefit if the oil supply could be improved, perhaps by the use of alternative materials to the wool packing. It may also be possible to damp out the one Hertz sway, associated with no. 15 trucks, reasonably cheaply.

A low voltage electrical system, using a reliable inverter to supply better interior lighting, headlights, turn and stop lights, matrix destinations, transponders, AVM, ticket validation and perhaps a public address system is also required.


- - The conversion from poles to pantographs could be effected in conjunction with this program.

Such a project could be done at Preston in parallel with its LRV involvement, matching the throughput to the Workshop capacity. My experience with such projects indicates that it would have a very positive effect on Workshop's morale and,

since the program would involve overhaul elements as well as modification, it would also reduce maintenance costs of these vehicles on completion.

There are now about 300 W trams in service, giving plenty of scope to select the best of the group for modification, retaining trams according to condition, not class.

Possible changes have been discussed often, but not recently listed for consideration on a cost-benefit basis; it is possible that each of these vehicles could be considerably improved for a tenth of the cost of a new tram. Since most of the projections I have seen recently imply a need for about 125 W trams when the 130 LRVs have entered service, the amount involved would probably be between \$10M and \$15M, in 1988 dollars.



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