

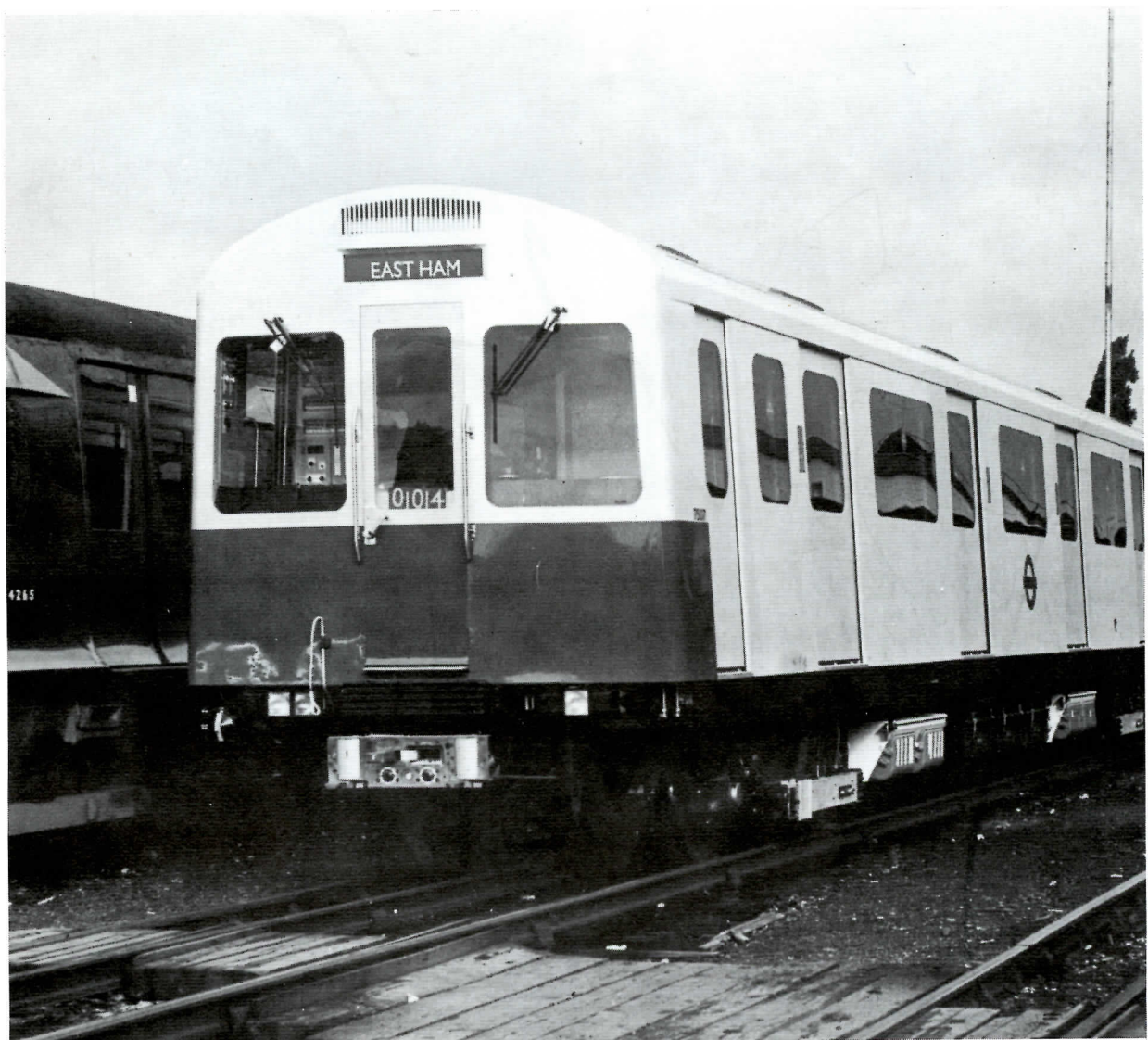
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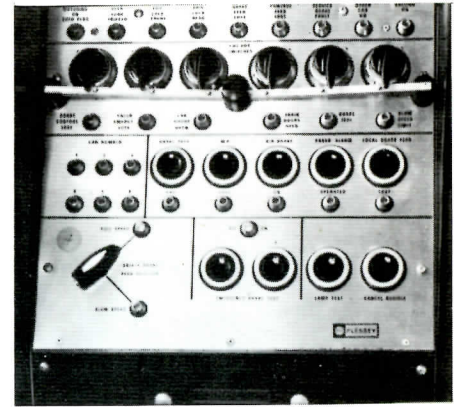
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D STOCK SUPPLEMENT



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THE D STOCK

Introduction to the D Stock

When the delivery of the new rolling stock for London Transport's District Line is completed in about two years time, not only will the whole line be equipped with new trains, but a most difficult operating and maintenance problem will have been overcome: that involving the use of more than one type of stock on the same services. This situation has existed since the delivery of the F Stock in the 1920's and has, during some periods, involved the use of four different and incompatible types of stock on the District. This problem was further aggravated by the use of both 6-car and 8-car train formations for many years. Eight-car trains were only used during peak periods and coupling and uncoupling operations were carried out twice daily. The use of 8-car trains at many of the District's central area stations also meant that the short platforms at these stations had to be extended into the tunnels with narrow wooden catwalks - another unsatisfactory situation. The position has been eased since 1971 when a 7-car formation was adopted in place of 8-cars, and 6-car sets were normally now confined to the Edgware Road to Putney Bridge section which had shorter platforms than other District stations.

During the early 1970's it was planned that the new rolling stock which would be delivered during the period 1978-80 would be 1978 Tube Stock. This was intended for use on the Fleet (now Jubilee) Line Stage 2 extension to Fenchurch Street. When the possibility of starting work on Stage 2 receded because of political financial restraints, the resources of LT's development engineers were diverted to designing new stock for the District Line. The original rolling stock replacement programme had envisaged the new District stock arriving from 1982 onwards. This was thought to be acceptable because much of the existing stock (the R Stock) dates from the early post-war years and the CO/CP Stock, although delivered during 1938-40, had been re-equipped during the late 1950's and early 1960's during its conversion from Metadyne to PCM traction equipment. The average 35-40 year life span of most rolling stock will not have been reached with all of the R Stock before its withdrawal but the reduced maintenance costs and elimination of the dual stock operation problems will more than compensate.

One difficulty which still exists on the District Line is the length of the platforms on the Notting Hill Gate to Paddington section. These are generally 300ft in length as opposed to the 360ft minimum length available at other stations. A 6-car train, with each car about 50ft in length, is the best which can be accommodated in these short platforms. As the first stage in the District Line new

COVER PHOTOGRAPH: 7507 at Ealing Common Depot, 3-9-1979.

TOP: 7501 & 17500 with match wagon at West Ruislip, 29-6-1979, before entry of this, the first unit delivered, into Ruislip Depot.

CENTRE LEFT: View of D stock cab interior showing the new design of driver's console, 'fore & aft' controller handle, ashtray (since removed), new design of driver's seat (temporarily covered in polythene) and the door controls on the console edge & on the rear bulkhead.(R.Greenaway)

CENTRE RIGHT: T.E.P. top panel.

LOWER LEFT: Interior of a driving motor car showing the centre grab poles and the grilles in the ceiling, behind which are the fans.

LOWER RIGHT: Interior door push button, illuminated and ready for use.

stock scheme it was decided to introduce C Stock, as used on the Circle and Hammersmith & City Lines, on the Edgware Road to Putney and Wimbledon services. Although stock working these services had always been maintained at District Line depots, the additional trains of C77 Stock purchased for this section were integrated with the existing C69 Stock and are now maintained at Hammersmith Depot. Now an opportunity became available to design a train of up to 360ft in length for use only on the District 'main line' services between Upminster and Ealing, Richmond and Wimbledon, and for this to be the only stock to be maintained by District Line depots. The new trains were to be known as D78 Stock but, as 1978 has been passed as an initial delivery date, D Stock has become the more favoured notation.

Design Considerations

In order to obtain the best economics in both capital cost and in maintenance costs there are a number of considerations which have been taken into account during the design of the D Stock. To begin with the experience gained with the 1973 Tube Stock built for the Piccadilly Line has been found useful in using a similar train formation. It was found possible to design a 6-car train of 362'-6" length using cars of about 60'-0" length. This car length is about 8ft longer than that of the traditional Underground car and about 3ft longer than the 1973 Stock car. The car width has also been adjusted to 9'-4" on the new cars compared with the 9'-8" of the C0/CP and R Stocks. These new dimensions are possible within the District Line loading gauge as there are no severe curves on the line.

Another feature of the D Stock which assists with ease of operation and will improve stock availability is the use of 2 x 3-car units to make up a train. Most units will be of Driving Motor - Trailer - Uncoupling Non Driving Motor formation (130 units) and will be coupled DM - T - UNDM + UNDM - T - DM to make a 6-car train. As the stock will not be turned round during its use on the District the units are not reversible and they will be known as 'A' units or 'D' units according to whether the driver's cab is at the West or east end of the unit. A further 20 units are double-ended, i.e. formed of DM - T - DM having a driver's cab at each end. These can be used as an east or west end unit as required and provide a greater degree of flexibility when replacing defective units in a train formation.

One of the biggest savings in running costs is expected to be achieved by extending the maintenance periods. The weekly examination period of the old stock is to be extended to two weeks, the depot inspection is now planned to be every 30 weeks instead of 9 weeks and the carbody lifting period is increased from 1 year to 3 years. It is intended that the new stock will only require heavy overhaul in Acton Works once, after about 17 years service, during its 35-40 year life.

Car Body Design

Special attention has been paid in the design of the carbody of the D Stock to provide a door service which will allow a good passenger flow at stations plus a reasonable seating layout. As the two considerations are not really compatible the result can only ever be a compromise and, on the D Stock, this has taken the form of four 3'-6" door openings per car side with 48 seats for bodies without cabs and 44 seats for bodies with cabs. The 3'-6" door width has been chosen so as to allow a single leaf door to be used. Previous stocks have used a double door of 4'-6" width or a single door of 2'-3" width. In the case of the R Stock

there are 14 double and 10 single doors. This total of 24 doorways is equalled on the D Stock but all are 3'-6" wide. The value of providing four wide door openings has been proved on the C Stock and operational experience with the old F Stock, and up to date research, suggests that the 3'-6" doorway with an 8" standback space, as provided on the D Stock, will provide the same passenger flow at stations as the 4'-6" doorway. By reducing the number of door leaves, from six per side on the old stock to four per side on the D Stock, the amount of door operating equipment can be reduced.

All passenger seats on the D Stock are longitudinal except for two facing pairs of transverse seats at the car centre. This allows large areas of standing space calculated to accommodate up to 178 extra passengers in a driving motor car and 184 extra in other cars. Two vertical handrails, memories of the F Stock again, are provided along the car centre line between the sets of longitudinal seats. How long these will last before their removal as an obstruction to passenger movement remains to be seen. The seat upholstery is of the traditional all-wool moquette which, after a series of experiments including the fitting of plastic seats on COP trailer car No 014082, has been found to be the best material for seat covering. Fire resistant foam was originally specified for the car seats but this was changed for a new design which eliminated the need for foam as it was still found to be unacceptably inflammable.

Flooring is also the traditional as used on the Underground. Grooved, fireproofed maple wood is still regarded as the best covering available, as tests with floor tiles and carpet in older cars have shown. Walls, ceilings and the interior surfaces of doors are finished in Melamine as it is easily cleanable, does not require painting and is easily replacable. The interior advertisements are of a new type covered by a flexible transparent foil. This will allow a better protection for the prints.

The exterior finish of the carbody and roof is of the usual unpainted aluminum alloy, apart from the red band provided across the cab fronts as was first tried on the 1973 Stock. Windows are of tinted glass to help reduce interior temperature during sunshine and the interior casement lights are fitted with special gas cylinders to allow easier opening when cleaning. Special locks are fitted to ensure the lights remain closed in service.

The D Stock car underframe is made of aluminium and the body has the now conventional rivetted aluminium structure. However, instead of having the usual body-side profile where the side tapers inwards from the waist, the D Stock has flat bodysides although the sides do slope inwards but from floor to cant rail level. The flat bodyside idea allows a simpler form of door construction of the bonded honeycomb type which is lighter and cheaper than the older forms of cast or welded type.

Doors and Door Control

Because of the larger door it has been necessary to introduce a new type of door engine for the D Stock. Previous stocks use a system involving a twin differential cylinder operator connected by a rack and pinion to an arm which pulls open or pushes closed the door. One of the cylinders is smaller than the other and it is this one, which is normally always charged with compressed air, which closes the door and keeps it closed. To open the door the other, larger cylinder is charged with air and the force exerted overcomes the pressure of the smaller cylinder to open the door. To close the door the air from the large cylinder is exhausted. The door engines on the D Stock however, have two similar sized cyl-

inders and each is charged with air in turn to open or close the doors. The door closing time has been reduced from 3-4 seconds on older stock to $1\frac{1}{2}$ -2 seconds on the D Stock. The quicker closing action and the larger door size has caused the introduction of hydraulic dampers on the door engine to prevent the door slamming, an idea first introduced on the 1973 Stock.

The door leaf is hung on nylon rollers which require no lubrication. There are no bottom rollers or door track, merely a simple guidance system using studs spaced at intervals on the door sill. This scheme was first introduced on the C Stock, after trials on an A60 Stock car, and proved beneficial in reducing instances of doors being jammed by rubbish.

A new attempt to improve passenger comfort has been introduced on the D Stock: Passenger Open Door Control. This idea was first tried out just before the last war but was finally abandoned in 1959 because of excessive maintenance requirements and problems with passenger use. The new system for the D Stock has been carefully designed and tested in order to overcome these difficulties but there is still much discussion, in the light of problems experienced in the past on LT and more recently on the Moorgate to Hertford service of BR, as to the viability of the scheme and, as a precaution, the wiring has been arranged for easy conversion to crew operated doors in the future.

The old passenger open door control system was arranged so that it could be brought into operation at any time during a journey by the guard. Usually this was done only at open section stations in cold weather. At other times the guard opened all doors himself. This led to confusion amongst passengers who never knew when they had to open the doors themselves, and there were many cases of people failing to use the Passenger Open buttons and getting overcarried. On the D Stock the plan has been arranged so that the passengers have to use the Passenger Open buttons on every occasion that they wish to board or alight. The theory is that in this way passengers will soon get used to the idea of using the system. To help bring the system to the notice of passengers the buttons at each doorway are illuminated with a 'press to open door' sign when the door open circuit is set up by the guard. This cannot be done until the train speed is below 4 mph. The guard cannot open all passenger doors himself except in an emergency or at a terminus by the use of a special key operated switch operated by the driver in his cab. He does however have complete control over the door closing system.

Another new facility provided on the D Stock door control system is 'selective close'. This was first tried on the C Stock and, as is proved a success, it was provided on the 1973 Stock. The scheme allows the guard to close all but one of the doors on each car so that interior heating may be retained during layover periods at termini. A further innovation on the D Stock is 'selective re-open'. This allows the guard to re-open the doors on one car if they have failed to close in the first instance due to an obstruction. On older stocks it was necessary to re-open all doors on the whole train in similar circumstances, an unnecessary practice, particularly on a crowded train. All the door controls are situated in the cabs so that the stock can be quickly converted to one man operation in the future. For the same reason the Passenger Open select and cab door open buttons are mounted on the drivers control desk and the offside console.

Apart from the standard door fault indicator lights fitted to the outside of each car, additional lights are provided in the driver's cab to indicate when passenger open control is in operation and which side of the train is affected. The usual pilot lights are provided to indicate to the guard that all doors are closed and these will not light up until the passenger open system has been cancelled by operation of the door close button.

Bogies

The D Stock design includes a big emphasis on a reduction in weight and therefore in energy saving. The total weight of a six car train when fully loaded will, at about 240 tons, weigh the same as a seven car train of R Stock when empty. The D Stock weighs 145 tons empty, about 60% of the R Stock when empty. This reduction in weight means that it is possible to use a smaller wheel and truck, equivalent to the tube stock size. The D Stock wheels therefore, are the same size as those used on 1973 Tube Stock and similar type LT118B traction motors are used. The truck and suspension design is however, entirely new.

The original intention for the D Stock was to use a system of air bags for suspension. An experimental pair of trucks was fitted to A60 car No 5218 with this system in 1976 but the extra cost and maintenance was not considered worthwhile in spite of the slightly improved riding characteristics. A further experiment was conducted on the same car which involved fitting a pair of rubber 'blobs' capable of taking all the forces associated with variations in car weight and the turning movements of the truck. It is reckoned that the 'blobs' will last for half the car life and will require no maintenance so this was the system finally adopted for use on the D Stock.

The design of the D Stock truck frame is also completely new to London Transport. It is of welded steel, box frame construction and is in the form of an 'H' with a rigid bolster. There are no headstocks. The axlebox suspension is of rubber chevrons of the now standard type, but no allowance is made for the adjustment of truck frame height because of wheel wear. Car body height is maintained by packing the suspension 'blobs'.

Traction and Braking Equipment

The D Stock traction equipment is very similar to that of the 1973 Tube Stock. Each motor car has 4 x 300 volt traction motors, the two motors on each truck being permanently connected in series. Traction control equipment, by G.E.C., is the usual pneumatically driven single camshaft type which controls both motor-ing and rheostatic braking power circuits. The control circuits from the driver's controller in the cab are duplicated so that if one circuit fails to operate only half the equipment on the train will be affected. The train can be driven using the remaining equipment to get it to the depot, although at reduced speed. This is another of the schemes first tried on the 1973 Stock.

Rheostatic braking, whereby the traction motors are used as generators to provide a braking effect, is designed for use whenever possible in preference to the air brake. The air brake, which is the Westcode system first tried on the 1973 Stock, is used for both emergency and service braking and is controlled by the same driver's traction brake controller in the cab. The Westcode system is described in 'Underground' No 6 issued last August.

Wheel slip/slide control, which is fitted to 1973 Stock, has been modified on the D Stock because of experience gained on the tube stock. The automatic notch back system of the 1973 Stock is retained for use when wheels begin to slip as the train is accelerating. Relays which detect the wheel slip cause the camshaft to run back until the wheel slip has ceased. The 1973 Stock also had automatic release of brakes on any truck where a pair of wheels started to skid during braking. The system was supposed to reduce the incidence of flatted wheels but this did not happen and the scheme has not been included on the D Stock.

A completely new feature of the D Stock is the Spring Applied Parking Brake (SAPB). All previous stocks have used handbrakes manually applied by the crew when stabling the train. Originally mechanical and, from 1967, hydraulically actuated, handbrakes have always caused problems, being left on or off at the wrong times, leakages of hydraulic fluid under cars and insufficient strength of the mechanical type, to name but a few. The Spring Applied Parking Brake attempts to overcome all of these problems because it is fully automatic in operation. Springs inside the brake cylinders of the motor cars will apply the brake block block to the wheel as soon as the air supply on the train falls below a level sufficient to apply the air brake. No action is needed by the crew. The system has not been used on LT before, apart from a trial of it on C Stock car 5535, and its appearance is another indication of the thinking on LT which is heading towards a train running without a crew.

Lighting, Heating and Ventilation

The main car lighting of the D Stock is, like all stock built since the last war fluorescent. A motor alternator set is provided on each motor car which supplies 230 volts AC stepped down to 115 volts for the lighting. The M.A. set on one of the motor cars supplies the lights down one side of every car in the unit while the set on the other motor car supplies the other half of the lights down the other side of the unit. Two battery fed emergency lighting tubes are provided on each car and are fed through inverters to provide the AC supply.

Ventilation and heating arrangements on the D Stock are very complex in an attempt to overcome the problems of cold in Winter and excessive heat in Summer. The latter is more acute on modern stocks because of the lack of any toplights which can be opened by passengers. These were eliminated from the design of the 1967 Tube Stock so that it would not be necessary to close them before passing the train through a car washing machine, and they have not been provided on stocks built since that time.

Each unit of D Stock is provided with an additional motor alternator set mounted under the trailer car which supplies the ventilation fans. These are mounted behind grills in the roof and will run in two stages, either half or all fans on. When running, these fans recirculate air inside the car. In addition, two large fans of the type fitted to the C and 1973 Stocks will be fitted inside each car in the roof near the end doorways. These fans draw in fresh air from outside the car. Heating is provided by heaters of the 'embedded-element' type similar to those fitted to the R and A Stocks. When fully commissioned the system will operate as follows:

Below 18 C: Heaters On

18 - 20 C : No Heaters or Fans

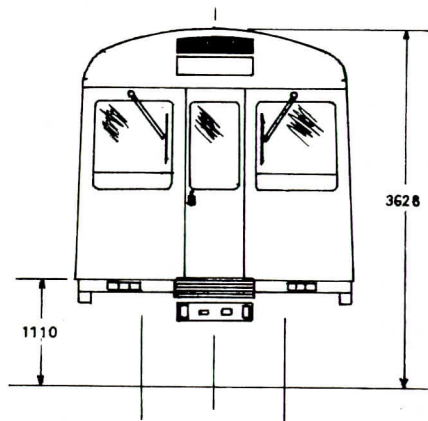
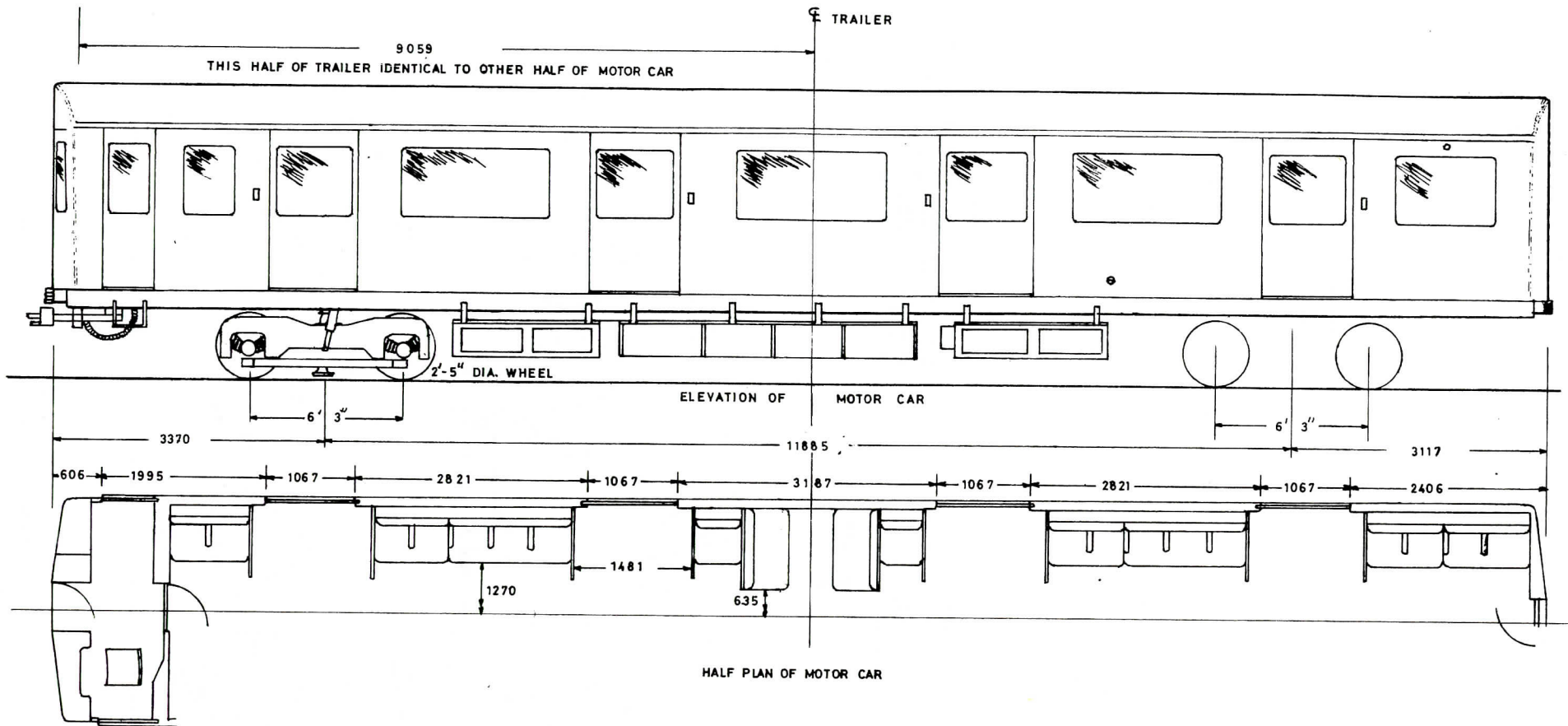
20 - 22 C : Half Recirculating Fans On

22 - 24 C : All Recirculating Fans plus Half Fresh Air Fans On

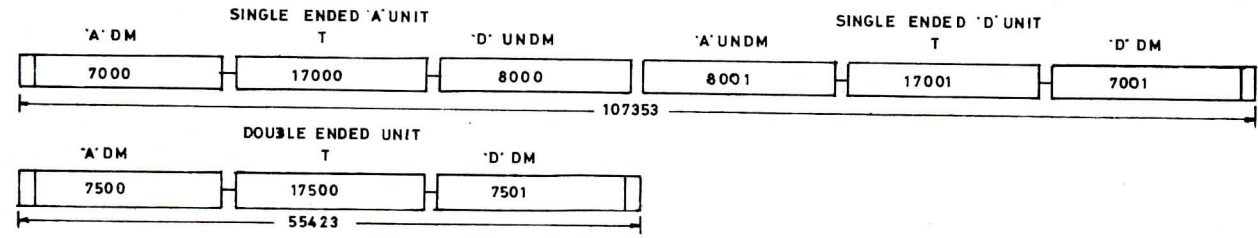
Above 24 C: All Fans On

The recirculating fans operate on 240 volts AC supplied by the Fan MA set on the trailer. The fresh air fans operate at 50 volts DC supplied by the main MA set or train batteries. If the main MA sets cannot supply the fresh air fans because the traction current supply is lost the batteries will continue to supply the fans until the battery voltage falls to 40 volts. It is hoped that this provision will allow the interior temperature of trains stalled during a power failure to be kept to a reasonable level.

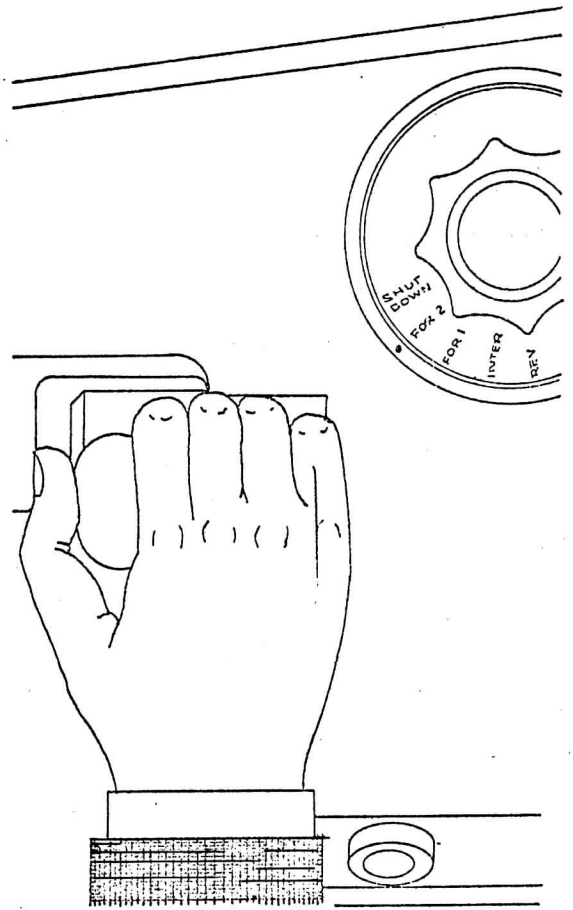
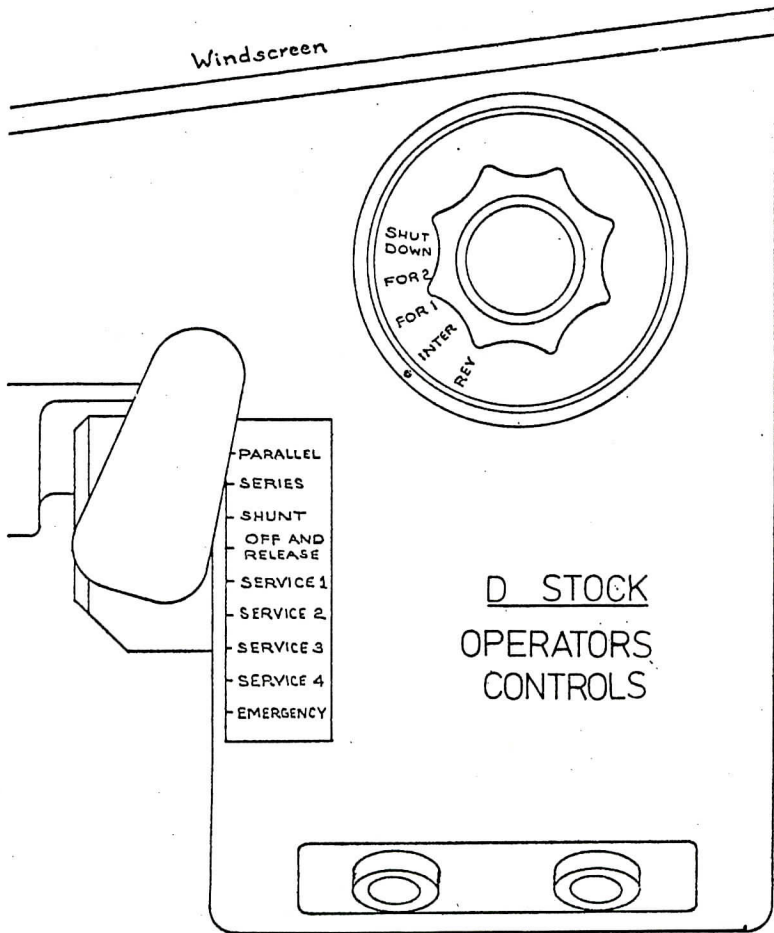
In addition to all the electrical means of keeping car temperatures at a reasonable level all the passenger and door glazing is tinted and car roofs are white



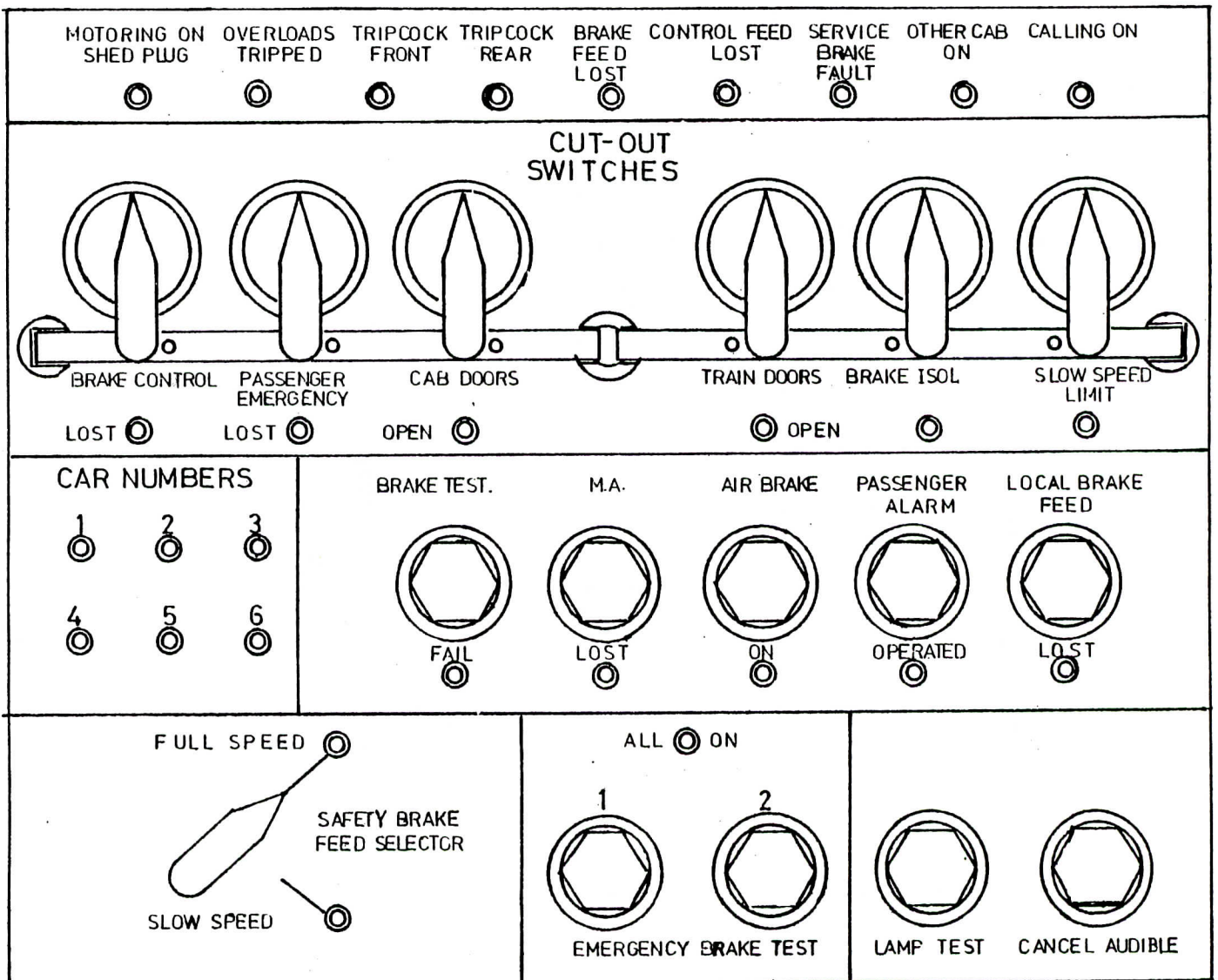
D STOCK



DIMENSIONS IN MILLIMETRES EXCEPT TRUCKS



T.E.P



to help reduce the interior temperature during sunshine.

Couplings

It is only necessary to provide full mechanical, electrical and pneumatic couplings with automatic operation at those car ends which need to be coupled to form a unit. For this reason the D Stock has fully equipped couplers only at the outer ends of UNDM's on single ended units and at both the cab ends of double ended units. The cab ends of single ended units have emergency mechanical couplers only. These principles were first adopted on the 1973 Stock.

All stocks built before the D Stock have centrally positioned spring buffers. At the uncoupling points it is only necessary to release the couplers and the two units will push apart because of the spring buffers. On the D Stock, because the extra length of the cars causes additional sideways movement of the car ends on curved track, it has been decided not to use the traditional spring buffers in case these become locked on severe curves. All the buffing loads are therefore taken through the drawbar and its specially designed connections to the car body. In case of collision, special solid buffer blocks are provided in place of the traditional spring buffer, and these are ridged to prevent overriding in cases on contact. The ridged blocks are very similar to the ridged blocks provided on the District Railway's B Stock built in 1905, and the design principle is the same.

The feature of the new coupling design which is most easily seen is the gap between cars when looking from the side. The only visible connections between the cars are the drawbar and the electrical jumpers. The air supply is carried by the drawbar and has two separate pipes. A pair of valves connected to these pipes on each car will prevent a loss of air pressure on the car if the connecting pipe is fractured. These valves are known as 'Flow Cut Off Valves' and are another new feature of the D Stock. It is hoped that they will prevent a long delay to a train which has developed a burst pipe whilst in service.

Cab

There are a number of new features in the D Stock driver's cab. The cab seat is of a type not seen on LT before but which has been in use on BR for many years. It has adjustments which allow it to be moved vertically or horizontally or to rotate. The driver's control desk in front of the cab seat is also of a new design. The Speedometer and air gauges are angled towards the driver, a new type of combined traction/brake controller is provided and the Forward/Reverse selector is operated by a Yale type key instead of the traditional reverser key.

The Combined Traction/Brake controller is of the forward and aft type. Although the idea is not new on the Underground, having been tried first on the 1936 Tube Stock (with traction control and braking on separate handles) and then on a 1938 Stock motor car during the early 1950's, this is the first time it has been adopted as standard on a whole batch of stock. For motoring the handle is pushed forward, for braking it is pulled back. The handgrip at the top of the handle is 'T' shaped and is spring loaded to provide the deadman facility. The handle itself is also spring loaded so that if released in a motoring position it will spring back into a braking position. This is another idea which is not new to the Underground, having been adopted on the British Westinghouse equipped cars of the Metropolitan Railway.

As is now standard on all new LT trains the driver's cab has air operated sliding doors with pneumatic seals to prevent draughts. The passenger door controls are also in the cab to allow future one man operation. A Train Equipment Panel (TEP) of the same principle as that fitted to the 1973 Stock but of a new design, is provided on the D Stock. It shows faults arising on the train and provides the driver with a means of isolating them from the cab.

The type of headlights first introduced on the 1967 Stock, and the long standing tradition of mounting headlights on the end body panels, is discontinued on the D Stock. Headlights are now square in shape and are mounted on the headstock in a unit with the tail lights, stabling light and orange 'calling on' light. The calling on light is fitted for future one man operation.

It is now standard practice to fit all trains with weak field motor control. In each cab a flag switch is fitted which when cut in provides additional speed for use on open sections of line. When the switch is cut in a black and yellow striped flag appears in the cab window to indicate this. The same facility is provided on the D Stock but an additional flag switch is also provided for the first time. This is the Coasting Control switch, which is indicated by a green and white flag appearing in the cab window. Coasting control causes the motors to switch off automatically when the train speed reaches 40 mph and to switch in again at 36 mph. The driver will keep his controller handle in the full motoring position during this time. Operation of the flag switch will cause the coasting control to be cut out so that motors will continue to operate regardless of train speed.

Because of the increasing number of incidents of objects being thrown at moving trains the driver's windscreen on the D Stock has been made of missile proof glass. The window wiper blade has been redesigned to give a larger clear area by adopting a parallelogram linkage to the drive. It is a pity that the blade is still too short to clean the lower area of the window. However, the offside window now has its own window wiper to allow the second man in the cab necessary during training to have a clear view.

On the 1973 Stock a motorised destination blind and train number display, with transmission equipment for Positive Train Identification was fitted. All this has been omitted from the D Stock but provision has been made for its use in the future if required.

Train Equipment Panel

As mentioned above, a Train Equipment Panel (TEP) is provided in each driver's cab. Although the principles first adopted on the 1973 Stock are retained on the D Stock there has been much modification in the light of the experience obtained since the tube stock version entered service. Because of a number of difficulties with spurious indications and intermittent failure indications on the 1973 Stock TEP's the new version has been built to a much more rigorous specification. The display has also been modified to show only failure conditions instead of failure and 'OK' conditions of the earlier model. Now also, the face of the panel is angled towards the driver so that he does not have to leave his position to see the display clearly.

Indications on the TEP are provided if control supplies are lost for motoring or braking and to show the cause of an emergency brake application. A 'Sonalert' audible warning is also provided to alert the driver to a malfunction. Facilities for testing the Westcode brake and for quickly locating the car on which an emer-

gency push button has been operated. Should the brake fail to release on one car means to release it remotely from the cab are provided on the TEP.

The TEP also provides for two modes of running, Slow Speed and Full Speed. In the normal condition the train will run up to the full speed under the control of the driver, subject to the Coasting control of course, in the usual way. Slow Speed, which allows the train to run at up to 15 mph, is adopted when any of the safety devices on the train have been operated or have failed. If the driver exceeds the 15 mph limit the emergency brake will be applied on all cars. The Slow Speed limit is, for example, imposed automatically if the front tripcock on the train is operated and remains in force for three minutes to ensure that the train runs at caution speed if a signal has had to be passed at danger.

A new system originally proposed for the D Stock was to use an audible warning in the driver's cab when a passenger emergency switch was operated instead of allowing the emergency brake to be applied. This was suggested in order to reduce the increasing number of incidents of malicious operation of passenger emergency devices. The system was fitted to the first train delivered, but has not been included on subsequent trains and will not be used on the trains when they enter service.

The TEP uses modern electronic circuitry by sending pulses down the train to a slave unit on each car. The slave units monitor the operation of the equipment on the car and send back messages to the TEP according to the results of the monitoring circuits. If a slave unit fails for any reason the TEP displays a flashing light on the car number concerned.

Delivery and Numbering

Unlike the 1973 Tube Stock, where the majority of single ended units were delivered first, the delivery of the D Stock commenced with the double ended units so that some flexibility of train formation was available at an early stage in the delivery programme. The first unit, Nos 7500-17500-7501, was delivered to Ruislip depot on 29th June 1979. Unlike most rolling stock delivery programmes over the last 20 years where the stock has been delivered to Ruislip minus traction motors, and much other equipment, and a long programme of fitting and testing of equipment has been undertaken, the D Stock has arrived in virtually complete condition. The only equipment which has to be fitted by LT is the shoegear, which cannot be mounted on the trains as they travel over BR lines from the Metro-Cammell factory in Birmingham as it is out of gauge. Once the shoegear is fitted, the trains should be ready to enter service. Naturally, there are always minor teething troubles with any new rolling stock, and the D Stock has been no exception. A detailed testing programme has been under way since the delivery of the first unit and a number of problems have arisen which have to be rectified before the trains can enter service.

When any new stock enters service it is necessary to train all the staff who will come into contact with it. This involves not only the train crews but also the maintenance staff. Training started early in September 1979 and will continue until after Easter 1980. From the middle of November two trains were allocated to driver handling training and were kept at Barking to allow training runs between there and Upminster which take place between the rush hours.

Another new feature of the D Stock delivery programme is that instead of the new cars being delivered to Ruislip and being made ready for service there, the units are transferred to Ealing Common depot dead between two 2-car units of C0/CP Stock motors. These units were specially adapted for the purpose when withdrawn from

passenger service. On arrival at Ealing Common the shoegear is fitted and a programme of pre-service testing is undertaken.

The fleet of D Stock will consist of 75 trains, a reduction on the originally planned total of 77 trains. The stock is divided into a total of 65 west and 65 east end units plus twenty double ended units. The cars will be numbered thus:

Single Ended Units:

West End				East End		
DM 'A' End - Trailer - UNDM		UNDM	+	UNDM - Trailer - DM 'D' End		
7000	17000	8000		8001	17001	7001
7002	17002	8002		8003	17003	7003
and so on until						
7128	17128	8128		8129	17129	7129

Double Ended Units

DM 'A' End - Trailer - DM 'D' End		
7500	17500	7501
7502	17502	7503
and so on until		
7538	17538	7539

The strain gauge body shell, used at the Metro-Cammell works for extensive body tests, has been utilised as the body for trailer car No 17512. Normally the strain gauge body shells are not used as part of the rolling stock fleet that is being tested for, and they are subsequently scrapped. The companion motor car to this trailer, No 7512, took part at Metro-Cammells in experiments with green stripes on the car body as a means of District Line identification, but the idea was not adopted. It was originally proposed that the D Stock would have no colour relief, apart from the car number and the LT roundel on the motor cars, but a later change of policy saw the stock delivered with the lower half of the cab fronts painted red as on the 1973 Stock.

The first D Stock Unit delivered was allocated to the Chief Mechanical Engineer's design division for tests and was taken, by the CO/CP Pilot motors, to the test tracks between Acton Town and South Ealing on Thursday 26th July where, after uncoupling, it ran under its own power. On Saturday 28th July the unit ran to Acton Works under its own power so that the cars could be weighed. Since that time a number of gauging runs have taken place as follows:

Sunday 12th August - the western branches of the District Line to Richmond, Wimbledon and Ealing Broadway, and the Outer Rail of the Circle Line.

Sunday 19th August - the Inner Rail of the Circle Line, Upminster, Barking Sidings, Dagenham East bay platform and Olympia.

Sunday 24th September - Plaistow Bay platform.

All these clearance runs have taken place during normal traffic hours on the day concerned and each has started and finished at Ealing Common Depot. In addition the unit has been taken to the Amersham line of the Metropolitan line for high speed running and braking tests. Trial running has also taken place on occasions between Ealing Common Depot and Ruislip siding on Mondays to Fridays starting on 26th September.

At the time of writing, December 1979, it is planned that the first D Stock train will enter passenger service on 28th January 1980. Two further trains are expected to enter service during the week commencing 4th February.

Publicity

The introduction of Passenger Door Control on the D Stock has meant that a press and publicity campaign has had to be devised to cover all the areas served by the District Line. The campaign started on Thursday 3rd Jan. 1980 when a special 6-car train (7532-17532-7533+7530-17530-7531) travelled to Mansion House bay platform, arriving about 10.30, where Sir Horace Cutler, Leader of the Greater London Council, demonstrated to the press a passenger door control button on trailer car 17530. Sir Horace and Mr. Ralph Bennett, Chairman of the London Transport Executive, then the press party to the west end car (7532) where Mr. Bennett addressed them, explaining details of the new trains and why passenger door control had been introduced. Sir Horace then made a speech and afterwards drove the train to Earls Court with the press party as passengers. The train reversed in platform 3 at Earls Court and then returned to Mansion House arriving at about 11.50.

A train of D Stock was scheduled to be made available for inspection by local authority representatives and the public at the following locations:

- 9th Jan. - Mansion House - Earls Court - Mansion House for LT Passengers Committee
- 10th Jan - as 9th Jan for Greater London Council
- 14th Jan - at High St. Kensington (bay) for Borough of Hammersmith & Fulham
- 15th Jan - at High St Kensington for Borough of Kensington & Chelsea
- 16th Jan - at Mansion House (Bay) for City of Westminster
- 17th Jan - at Mansion House (Bay) for City of London
- 18th Jan - at Mansion House (Bay) for Borough of Tower Hamlets
- 21st Jan - at Ealing Broadway (platform 7) for Boroughs of Ealing & Hounslow
- 22nd Jan - at Richmond (platform 7) for Borough of Richmond
- 23rd Jan - at Wimbledon (platform 4) for Borough of Wimbledon & Merton
- 24th Jan - at Barking (Bay) for boroughs of Newham, Barking and Havering.

The displays at the various stations beginning on 14th January were to start at 10.30 for the local authority representatives and were to be opened for the public from 12.00 until 15 30.

Publicity for the new trains in the form of posters on stations and leaflets available at booking offices and travel enquiry offices has emphasised the new door system. Notices are also being provided in the new trains describing in several languages how to operate the push buttons. On each of the passenger doors a notice has been provided which reads "To open the door, push the button"

Entry in to service for the first D Stock train is scheduled for Monday 28th January in the working of train 46. Crew training started at Ealing Common in mid September and special runs for crews to learn how to handle the new trains started in late November between Barking and Upminster using two trains.

One feature of the new trains which was first seen on the press run of 3rd January was the new design of District Line route map. It excludes the Circle Line completely except for interchanges. Station names are printed in upper case lettering. During the press run the handling and riding of the new stock seemed to be good, actually being very similar to the 1973 Tube Stock. It was through the courtesy of the Press Office of London Transport that we were officially afforded the press facilities and the Society is grateful to them for the invitation. Much of the information made available in this supplement has also been obtained through the kind help of London Transport and its staff, for which we are indebted.

Further Notes on Deliveries

In order to provide readers with up to date information on the delivery of D Stock the following notes are added. To begin with it is worth recording that the original programme envisaged the first unit being delivered in May 1979. However, it soon became apparent that June was going to be the more likely month. In fact it came right at the end of June. As a result, the entry into service date was put back from early October to early December. Further delays caused by industrial action by GEC staff installing electrical equipment at Metro-Cammell's works, and by the national engineering strike, caused the entry into service date to be put back to the now fixed date of 28th January 1980. Deliveries have been as follows:

Unit	Delivered Ruislip	To Ealing Common
7500-17500-7501	29.06.79	29.06.79
7502-17502-7503	13.07.79	13.07.79
7504-17504-7505	13.07.79	14.07.79
7506-17506-7507	26.07.79	26.07.79
7508-17508-7509	24.08.79	24.08.79
7510-17510-7511	13.09.79	13.09.79
7512-17512-7513	24.10.79	24.10.79
7514-17514-7515	24.10.79	24.10.79
7526-17526-7527	13.11.79	14.11.79
7528-17528-7529	13.11.79	13.11.79
7530-17530-7531	04.12.79	05.12.79
7532-17532-7533	04.12.79	04.12.79
7534-17534-7535	11.12.79	14.12.79
7536-17536-7537	11.12.79	13.12.79
7538-17538-7539	18.12.79	03.01.80
7516-17516-7517	18.12.79	04.01.80

There are now four double ended units outstanding delivery. It is expected that the first of the single ended units will arrive with the next train to be delivered in mid-January.

TOP LEFT: 17510 trailer car at Amersham during 6-car tests, 23-10-1979.

TOP RIGHT: The same train as above on its way back to Ealing Common Depot. It is seen here reversing in the Westbound platform at Rayners Lane.

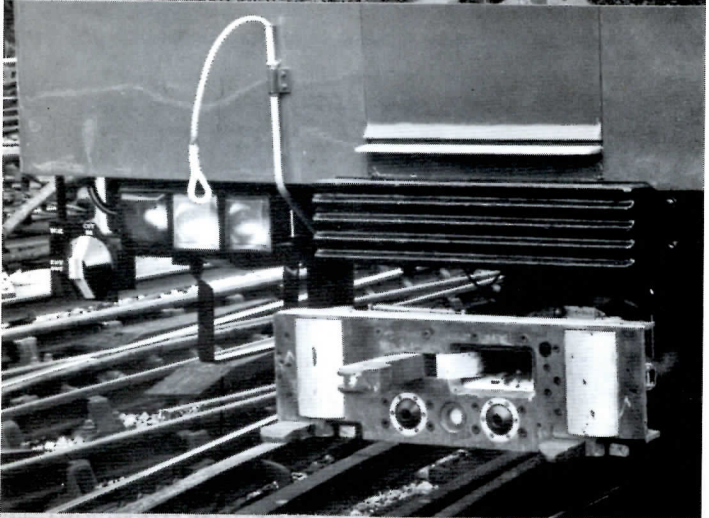
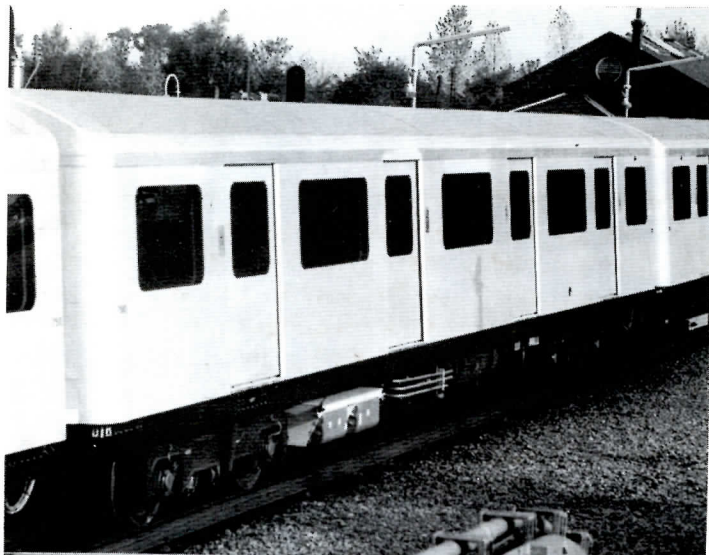
CENTRE LEFT: Close up of the ridged buffer block and a lamp cluster.

CENTRE RIGHT: 7501 at the head of a 3-car train at Ealing Broadway during clearance tests on Sunday 23-9-1979.

LOWER LEFT: A bulkhead car card on car 7532 on 3-1-1980, instructing passengers in English, German and French how to open the doors.

LOWER RIGHT: Sir Horace Cutler, Leader of the G.I.C. posing for photographers on 3-1-1980, during the Press Run. (All photos. - B.R.Hardy)

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You must push the door button to leave the train

To keep the weather out and the warmth in, this car is fitted with door buttons which you must push to open at your station. Push either button when the sign is lit.

The Guard will not open the doors

Zum verlassen des Zuges muss der Türschalter betätigt werden

Dieser Wagen ist zum Schutz gegen das Wetter mit Türschaltern versehen, die Sie auf Ihrer Station betätigen müssen, um die Tür zu öffnen. Wenn das Zeichen aufleuchtet, einen der Schalter eindrücken.

Vom Schaffner wird die Türen nicht geöffnet

Vous devez appuyer sur le bouton de portière pour descendre du wagon

Pour demeurer à l'abri des intempéries et conserver la chaleur à l'intérieur, ce wagon est équipé de boutons de portière sur lesquels vous devez appuyer pour ouvrir lorsque vous arrivez à votre station. Appuyez sur l'un ou l'autre des boutons lorsque le signal est allumé.

Le chef de train n'ouvrira pas les portières

