

# WHAT CAN RUN WHERE?

by John Hawkins

My "What Can Run Where?" article in the July 2008 edition of *Underground News* was written in anticipation of promised widespread change to the system under PPP. Since then, the three surface stock types have been replaced by a standard stock in 7- and 8-car formations, and resignalling is beginning to affect those lines. It has also affected the Victoria, Jubilee and Northern lines, the first receiving its own non-standard trains. The anticipated upgrade of the Piccadilly Line has been delayed, and that for the Bakerloo Line remains in doubt. Permitted Running Routes for Passenger Rolling Stock now runs to 62 pages, whereas the 2008 edition required only 27, and a 1979 version only 3! (see *Underground News* for February 2013).

Modern tube trains are now confined to their home lines, with only the legacy 1972 Tube Stock and 1973 Tube Stock permitted to wander, as are S7 and S8 stocks. The Victoria, Bakerloo and Waterloo & City Lines permit no passenger rolling stock visits, as for the Central Line outside of Ruislip depot. Surprisingly, the resignalled Jubilee and Northern lines still permit 1972 Tube Stock visits under restricted conditions. Severely restricted inter-working is allowed between the Piccadilly Line and sub-surface lines.

The operation of short trains outside of depots requires a cab at each end, now limited to the Piccadilly Line double-ended units, the Bakerloo Line 4-car units (except non-standard unit 3299-4299-4399-3399), and 4-car or 6-car trains on the Central Line. These are for empty stock working, except for a 4-car passenger service permitted between Woodford and Hainault (yet to be implemented).

Amongst many technical variations, regenerative braking varies between stocks, with the Northern Line limited to 675V DC, the Central and Jubilee lines to 790V, and the Victoria Line to 890V. On the sub-surface lines, the 650V DC limit is being increased to 890V, although between Harrow-on-the-Hill and Finchley Road it is currently 790V.

On the Bakerloo Line, the Willesden Junction bay road is noted as too short for LU passenger trains. 1972 Tube Stock was equipped with a static converter to supply auxiliary power for cab air-conditioning equipment and saloon ventilation fans. It was assessed for compatibility with Bakerloo signalling, but not with other lines, and must therefore be cut out at such times. These trains are limited to passenger operation on the Bakerloo Line. On the Jubilee Line 1972 Tube Stock is allowed between Charing Cross and Stanmore (where the new platform is not assessed), possibly in connection with stock transfers, and on the Northern Line on all routes, probably for Auto-Video inspection, accessed at King's Cross from the Piccadilly Line. On both these resignalled lines, movement is only within a possession or using an 'incompatible train movements' procedure. West Hampstead siding is reported as too short for 7-car 1972 Tube Stock, although usually used by longer 1996 Tube Stock.

From Neasden Depot, 1972 Tube Stock can transfer to the Metropolitan Line to reach Uxbridge, and is also allowed into Ruislip Depot. In addition to having the auxiliary converter isolated, all heaters must be off. They are not permitted north of Harrow-on-the-Hill, or south of Neasden due to the nominal traction voltage supply of 750V DC, and S Stock regenerative braking. This area of the Metropolitan Line should soon be resignalled, perhaps restricting such moves to possessions as on some other lines. From Rayners Lane, 1972 Tube Stock can travel to Cockfosters, limited to a 4-car unit there except western platform 1, or back to Heathrow. From Acton Town it can operate on the District Line to Ealing Broadway and as far as Barons Court, but not beyond due to the nominal traction voltage supply of 750V DC, and S Stock regenerative braking. It is not permitted on other District Line branches.

The 1973 Tube Stock was equipped with a static converter to supply auxiliary power for cab air-conditioning equipment. It was assessed for compatibility with legacy signalling on parts of the sub-surface lines, but not on other lines. 1973 Tube Stock is limited to passenger operation on the Piccadilly Line. On the Aldwych branch, no passenger trains are allowed since the track is not maintained to standard, and there is no provision for one-person-operation or for passenger/train interface validation. The maximum operating speed is 10mph, and access is only available in a possession. From Acton Town, 1973 Tube Stock can reach Ealing Broadway on the District Line, and travel back local road to Barons Court, but only to West Kensington for reversal in emergency or if misrouted, due to S Stock regenerative braking, so precautions must be taken and train systems checked after such a move. This

move, which dates back to the opening of the Piccadilly Line, is likely to be further restricted with the imminent resignalling of the Earl's Court area. Hammersmith local platforms were modified for better passenger access to S Stock, which means that they are unsuitable for 1973 Tube Stock without staff assistance. These trains are not permitted on other District Line branches.

From Rayners Lane, 1973 Tube Stock can only operate to Harrow-on-the-Hill and on to Neasden Depot in emergency or if misrouted, with heaters and cab air-conditioning turned off, and again must be checked upon return. They are not permitted north of Harrow-on-the-Hill, or south of Neasden due to the higher traction voltage and S Stock regenerative braking. This area of the Metropolitan Line should soon be resignalled, presumably prohibiting such moves. Beyond Harrow-on-the-Hill was not allowed in my last review of such moves. Should 1973 Tube Stock visit Ruislip Depot, the inter-car barriers must be removed for movements over tight curves. Ealing Common Depot has restrictions on roads available for 1973 Tube Stock for similar reasons, and precautions must be taken for visits to Acton Works.

The sub-surface lines now have a fleet of standard trains, but the longer formations on the Metropolitan Line cannot, of course, carry passengers on other lines because they do not fit platforms. If S8 trains are routed into Aldgate outer rail platform, they must draw forward into the sand drag in order to work back on the inner rail track. They may also be routed towards Aldgate East and on to Upminster depot, but passenger operation is limited to Whitechapel, the only off-line passenger trip in the whole document. S8 stock may be routed around the Circle Line via Victoria to Baker Street, or on to Ealing Broadway (southernmost platform 7 only) and Ealing Common Depot, but not in passenger service on these routes. S8 trains are not allowed to Kensington Olympia, Lillie Bridge Depot, or on the Wimbledon and Richmond branches. In Ruislip Depot, S Stock trains are limited to only one train at a time in restricted areas due to their high power demand.