

ENGINEER'S TRAINS CAN RUN WHERE?

by John Hawkins

My "Heritage Trains Can Run Where?" article earlier in this issue of *Underground News* was based on "Permitted running routes for engineer's trains and heritage trains" dated 19 November 2012, and so told only half the story. The engineer's side includes a wide variety of vehicles, so I wondered if restrictions vary as widely? Note that engineering vehicles such as road/rail vehicles do not operate as a train but operate only in a possession, and so are not included in this document.

There are some general restrictions that apply to most engineer's vehicles, so to avoid repeats throughout the article I summarise them here. With diesel powered vehicles, inadequate ventilation in tube tunnels means that safety rules must be applied and the engine shut down after 10 minutes without movement. This includes the White City sidings area, where only roads 1 to 3 and also 14 to 16 are available to suitable engineer's trains at 12kph, the other roads having staff accommodation behind the train arrestors that are only designed for 172 tonne 1992 Tube Stock rather than engineer's trains of up to 300 tonnes. On the Bakerloo Line No.1 road at London Road depot (numbered from left) is reserved for rail milling and grinding machines only.

The Piccadilly Circus crossover is the only one on the system listed with specific restrictions on use by most train types due to derailment risk. The January 2001 issue of *Underground News* noted five such derailments, four of which resulted in damage to the rear car of trains reversing south to northbound and exceeding the speed limit: a 1938 Stock in 1975, a 1959 Stock in 1988 and two 1972 Stocks in 1994 and 1996. The signalling has since been modified to enforce a low speed. The erstwhile Tunnel Cleaning Train also derailed there in 1997 due to a fault on the train.

Because of the risks, the southbound end of this crossover is now of a fully checked switch design on both through and turnout routes, a check rail extending up to the switch toes with a guard plate, commonly called a 'housetop', which acts as a guard through the switch toes. The housetop is positioned above the left hand switch rail so that the switch rail can move beneath it. In the turnout direction, the back of the open switch rail, with suitable support, provides the guard after the housetop and then a check rail is spliced into the back of the switch rail to continue protection towards the crossing. The housetop is painted yellow as a warning to staff that special care is required.

Reversals from the northbound line back to the southbound are specifically limited to emergency use to avoid deraiment or over-crowding safety risks. In contradiction the following rule talks of planned movements of engineer's trains here, other than in traffic hours, requiring hand greasing of the right hand switch of 7B points, the northern end.

Special restrictions apply to wrong direction through movements on the southbound line. Immediately prior to engineer's vehicles being permitted to move and prior to the start of traffic following use of 7A points, the following actions must be undertaken by an authorised and trained Inspector. The housetop securing bolts must be examined for movement. The bolts can also be torque checked. The clearance between the underside of the housetop and the top of the switch rail must be measured to ensure a gap of 3mm or more is maintained, and the housetop must be lubricated along its entire length. This is a minimum requirement and, where the housetop is exposed to a significant amount of engineer's train movements, intermediate inspection and lubrication of the bolts may be required at the discretion of the Inspector. The Inspector must carry the relevant tools to enable any loose bolts to be tightened. Should any deterioration of the housetop support occur that cannot be rectified by the Inspector, further movements in the wrong direction must not take place until the Bakerloo Line Track Manager has been contacted and any necessary corrective action completed.

The housetop bolts must also be inspected for signs of movement and the housetop lubricated along its entire length before and after the passage of each individual battery locomotive, or before and after the passage of each individual train consisting of more than one battery locomotive. Movement of any vehicle with wheel skates fitted in any direction over the points on the southbound line require either the skates to first be removed or the housetop to be removed from the track. Wheel skates, which resemble roller skates, are used by engineers under locked wheels to move defective vehicles.

At Golders Green engineer's trains are not permitted to enter maintenance shed roads 2, 3 and 5 due to a weight restriction. On the Victoria Line, due to a unique signalling system, all engineer's trains can only operate in a possession except within Northumberland Park depot. On the Jubilee Line extension a 10mph limit applies over points and crossings, and 5mph through stations from North Greenwich to Westminster inclusive with their platform edge doors.

The District Line seems to have the most general restrictions. The short berth in High Street Kensington platform 3 prevents operation of trains longer than 6-cars, whilst the surface stock friction buffer there restricts reversal during traffic hours to emergency use only for tube loading-gauge trains. Engineer's trains reversing at Whitechapel must now be at least 75m long to ensure that they are detected by the signalling system. Operation of engineer's trains, other than rail grinding machines, on the Richmond branch is restricted to the Network Rail boundary east of Gunnersbury. Permission may be sought to gain access to/from the eastbound line from there to Turnham Green.

LOCOMOTIVES

We usually recognise engineer's trains from the traditional battery locomotives at each end. The current battery locos are of 1964, 1969 and 1973 batches and are allowed to travel widely, including to Wimbledon and also East Putney platforms 3 and 4. The 1964 locos, other than L20 and L21, are not fitted for Central or Jubilee Line signalling and so cannot operate as a lead vehicle on the Central Line and can only operate in a possession on the Jubilee Line. Even fitted locos are not permitted to operate in TBTC mode over the connections to and from the Bakerloo Line at Baker Street. On the Metropolitan Line a 30mph limit applies except on the main lines between Harrow on the Hill and Amersham, where they may operate to the Network Rail boundaries. Restrictions on train formations apply through the wheel monitoring shed on 23 road in Neasden depot.

The Schöma four-wheel diesel locos must not usually operate as a single vehicle train since their short wheelbase is not guaranteed to operate track circuits, and only one tripcock is fitted at the cab end. However this is permitted within a possession. On the Bakerloo they are allowed on the LU section and also at Stonebridge Park depot, but not between! Being unequipped for Central Line signalling they cannot be a lead vehicle in a train outside of a possession. On the District Line they are banned from the Richmond branch and beyond Putney Bridge to Wimbledon. On the Jubilee Line they can only operate within possessions, being unequipped for the signalling system. On the Circle, Hammersmith and Metropolitan lines they are limited to 30mph. They must not depart from the easternmost Baker Street platform, number 4, to the northbound line at any time. Restrictions on train formations apply through the wheel monitoring shed on 23 road in Neasden depot. Access to other deep-level lines is allowed.

Diesel-electric ex-BR class 20 locos are allowed in Ruislip depot for shunting and for Metropolitan Line moves of new or scrap rolling stock, stock transfers and heritage train operations. They are permitted on the fast lines from Harrow to Amersham National Rail boundary, on the Watford triangle and on the local roads from Watford to Harrow on the Hill, to Ruislip depot and Uxbridge, to Wembley Park via the fast and local lines, to Neasden depot from either end except number 4 road, the northern depot reception road, and even as far as the north end of Dollis Hill station ramp on the southbound Metropolitan Line which would allow a long train to enter the depot from the south end. There must be a tripcock cut in at both leading ends of the train formation, and speed is limited to 50mph. In this connection, Falcon box MLA wagons 503001 to 503090 and bogie tank KBA wagons VTG85933 and VTG85936 are listed in the hauled wagons section, but limited to 30mph and must be unladen.

GBRf class 73 diesel electric locos are allowed in Ruislip depot only, including the spur to the Network Rail link at West Ruislip. GBRf train operators must be piloted by LU test train operators, and trains must comprise of two class 73 locos and can also contain four Metropolitan Line 4TC heritage coaches.

TRACK MAINTENANCE MACHINES

Other self-powered engineer's trains listed are various track maintenance machines. Tamping machines TM771, TM772 and TM773 are generally allowed throughout the system including to Wimbledon and East Putney platforms 3 and 4. They cannot operate as a lead vehicle on the Central Line as they are not ATP fitted, and are restricted to possessions on the Jubilee Line due to not having that line's signalling. They must not operate into Stanmore platform 3. On the Bakerloo

they can transit to Stonebridge Park depot, including diversion to Kilburn High Road if necessary. There is a maximum speed of 30mph on the Metropolitan Line except on the main lines north of Harrow-on-the-Hill. Restrictions on train formations apply through the wheel monitoring shed on 23 road in Neasden depot.

Tamping machine TM774 is not suitable for the deep level lines, but is allowed on the Central Line west from North Acton. It must not operate as a leading vehicle as it is not ATP fitted. It is limited to 30mph on all lines and must operate in a train formation, except in a possession when it can operate alone. It is not permitted to operate from the LU/Tube Lines boundary north of Wembley Park to north of Finchley Road station, and on the Piccadilly Line it is allowed between west of Barons Court and Hanger Lane Junction only. It presumably must use a National Rail route to reach the District, Circle and Hammersmith lines where it is cleared except on the Richmond branch.

The Harsco grinding machine is a permanently coupled 2-car machine which is not suitable for the deep level lines, but is allowed on the Central Line west from North Acton. It must not operate as a leading vehicle as it is not ATP fitted. It is limited to 20mph on all lines and must operate in a train formation, except in a possession when it can operate alone. On the sub-surface lines when travelling to and from a work site it must operate as the last or first train. On the District Line it is cleared to all destinations including the Wimbledon branch and East Putney platforms 3 and 4, and to the National Rail boundary on the Richmond branch from where permission can be sought to reach the eastbound line. However, it is not permitted in Acton Works, or on the Piccadilly Line beyond Hanger Lane junction or the Heathrow branch. It is also not permitted to operate from the LU/Tube Lines boundary north of Wembley Park to north of Finchley Road station, so must reach the District and Hammersmith lines by a National Rail route.

There are two diesel rail grinding machines, Schweerbau RGU and Schweerbau RG8, that have general clearance throughout the system with a maximum speed of 25mph. In traffic hours they must only operate as the last or first train, but are permitted to operate under their own power in a possession. They are confined to the LU part of the Bakerloo Line, and are not allowed in White City sidings due to their long fixed wheelbase. On the Jubilee Line they are confined to operating within a possession since they are not fitted with TBTC equipment, except for certain tripcock protected signalled moves in and out of Neasden depot and between the Jubilee and Metropolitan lines at Neasden station. They are not allowed beyond the Network Rail boundary on the Richmond branch. Unusually, when the tow-bar is in use for an emergency recovery of these machines, operation through eastbound platform 1 at Edgware Road on the sub-surface lines is not permitted due to track clearance issues.

The Schweerbau SFU-04 diesel rail milling machine has general clearance for most area, but is limited to 15mph. It must operate in a train formation, except in a possession when it can operate alone. When travelling to and from a work site it must operate as the last or first train. It is banned from National Rail north of Queen's Park, and from White City sidings due to its long wheelbase. It is allowed on the Wimbledon branch, but not to East Putney platforms 3 and 4. On the Richmond branch it is restricted to the Network Rail boundary east of Gunnersbury, unless authority is sought to reach the eastbound line from there.

Four self-propelled Cowans Sheldon cranes are listed, 7.5 tonne C623 and C626, and 10 tonne twin jib TRM627 and TRM628. These must operate in a train formation, except in a possession when they can operate alone. The smaller cranes are limited to 20mph on all lines. They are cleared for most lines, but cannot operate as a leading vehicle on the Central Line as they are not ATP fitted. North of Queen's Park they can only transit to Stonebridge Park depot, but can divert to Kilburn High Road if required.

HAULED WAGONS

It will come as no surprise that laden hauled wagons must be within gauge for their route. Transplant wagons seem to have general clearance for most routes. On National Rail tracks north of Queen's Park the 30 tonne bogie-flat wagons FW351, FW355, FW398 and the 40 tonne bogie high-deck wagons HD871 and HD876 can only access Stonebridge Park depot, but all other wagons can reach Harrow and Wealdstone except cement-mixer bogie wagons and their bogie match wagons, and 20 tonne bogie rail wagons. Exceptions to this latter restriction are individually identified CM951, CM954, CM955, MW956, MW958, MW959, MW960, MW961 and RW495.

Operation of hauled wagons on the Richmond branch is restricted to the Network Rail boundary east of Gunnersbury. Permission may be sought to gain access to/from the eastbound line from there to Turnham Green except for 8 tonne 4-wheel cable well wagons CW1053-1055, and all Jubilee Line Extension wagons JLE1-JLE23, since both types “must not operate on any Network Rail route without prior engineering acceptance and route acceptance” although this would apparently contradict the previous paragraph!

8 tonne 4-wheel cable well wagons CW1053 to CW1055 and 4-wheel cable well wagons JLE20 to JLE23 cannot depart northbound from easternmost Baker Street platform number 4 at any time, and are banned from White City sidings because of their long fixed wheelbase.