

Quarry Line derailment

This account is based on the Ministry of Transport's "Report on the derailment which occurred on 27th June, 1949, near Merstham Quarry Tunnel in the Southern Region of British Railways" dated 3rd August 1949

The four-track London-Brighton line splits into two separate routes at Stoats Nest junction, south of Croydon. The Up and Down Through tracks (as they were then termed) on the western side of the route diverge to bypass Coulsdon South station, cross over the Local lines at Star Bridge to tunnel under the North Downs and bypass Merstham and Redhill stations to the east before converging again with the Local lines at Earlswood.

The Quarry line, as this diversion is known, was used by most fast trains including, on 27th June 1949, the 2.25 p.m. electric passenger train from Victoria to Littlehampton, formed of a 6 Pul unit (leading) and 4 Cor unit 3152 (rear).

On that day, Ganger Stone and his men were working on a troublesome stretch of track at the south portal of Quarry Tunnel where Peters Bridge (since demolished) passed over the tracks. Clay pumped up between the sleepers here but the track could not be lifted and thoroughly rebalasted due to the very restricted headroom under the bridge. Three or four weeks earlier the gangers had riddled the ballast under the bridge and for two lengths on the south side of it in an attempt to improve drainage but now several rail joints needed lifting. This involved clearing the granite ballast around the sleepers either side of the joint, jacking up the rail by an inch or so and then repacking the sleepers with ballast.

The Quarry Line was laid with the Southern's standard 95lb-per-yard bullhead rail in 60ft lengths, mounted on wooden sleepers and joined by two-bolt fishplates with expansion gaps of ¼" at 60°F (15°C). However on this hot day - 87°F (31°C) in the shade - rails directly exposed to the sun were heated to about 135°F (57°C) and were now in compression with a stress of some 2¼ tons per square inch.

Ganger Stone was aware of the danger that jacking in hot weather could cause the track to buckle but, although the cutting was very hot, it was comparatively cool by the tunnel mouth and, as they were only lifting individual sleepers and not disturbing a complete length of line, he judged that the work could continue. They lifted two joints before the 2.0 p.m. Victoria-Brighton train passed and two more before the 2.25 p.m. train arrived half an hour later.

As the Littlehampton train emerged from Quarry Tunnel at 2.55 p.m., coasting down the descent towards Earlswood at about 55 m.p.h., Motorman Howell felt the train ride roughly and applied the brake briefly. The lurching became severe near the Rockshaw Road bridge but before he could make a second brake application he saw the air pressure in the train pipe drop to zero as the rear coach parted company, automatically applying the brakes in both parts of the train.

The guard of the Littlehampton train, riding in the brakevan at the rear of the sixth coach, felt his coach jerk and, looking back through the rear cab window saw the seventh coach swinging about and throwing up a cloud of dust.

Watching from the trackside the gangers saw the track under the train suddenly bulge towards them, heard a bang and saw the train enveloped in a cloud of dust. Stone sent his men to protect both lines with detonators and flags and ran to a signal telephone near Rockshaw road bridge some 300 yards further down the line to call the Earlswood signalman.

However the signalman at Merstham, on the adjacent Redhill line, had already seen the front portion of the derailed train come to a stand opposite his box and had warned the Earlswood signalman, who was able to stop the 2.25 p.m. fast electric train from Brighton to Victoria, which was approaching at high speed on the Up Main. Electric current to the Down line was cut off automatically by the circuit breaker at Three Bridges Electrical Control Centre as the derailed train caused a short circuit. Current on the Up line was switched off on request from the Earlswood signalman a few minutes later. This prompt action, together with the fact that the distorted track did not burst, undoubtedly prevented a more serious accident - in the event nobody was injured although three passengers later complained of shock.

The derailment had started with the right hand wheels of the leading (motor) bogie of the seventh coach (Motor Brake Saloon Third no 11221 of unit 3152) climbing the low rail and derailing to the right as the track distorted beneath the train. This derailment further distorted the track, causing the leading bogie of the ninth coach (Trailer Third 10106) to also derail, this time towards the left. Both bogies of the tenth coach (Motor Brake Saloon Third no 11222) derailed to the right and this coach broke away from the rest of the train as the violent movement of both coaches caused the coupler between the ninth and tenth coach to lift from the drawbar hook.

The Investigating Officer, Brigadier Langley, found that the track was in an unstable condition as the cleaning some weeks earlier had reduced the resistance of the ballast to lateral movement. This was compounded by a shortage of ballast from Peters Bridge to the point of derailment some 40 yards further on, with no ballast on the shoulders of the sleepers on the cess side and no ballast between the ends of the sleepers on the six foot side (i.e. between the down and up lines). Thirdly, the work in progress to open out individual sleeper ends for jacking had left these unsupported as the train passed over them. Fourthly, Brigadier Langley's inspection found that the routine work of greasing fishplates had not been carried out properly, with the risk that smooth expansion of the rails in the heat would be inhibited. None of these defects was alone enough to cause the derailment but in combination, and together with the compressive forces that had built up in the rails, they were enough for the train movement to start the track sliding outwards. Once the initial resistance of the ballast to lateral movement was overcome the buckling became progressively worse and the train derailed.