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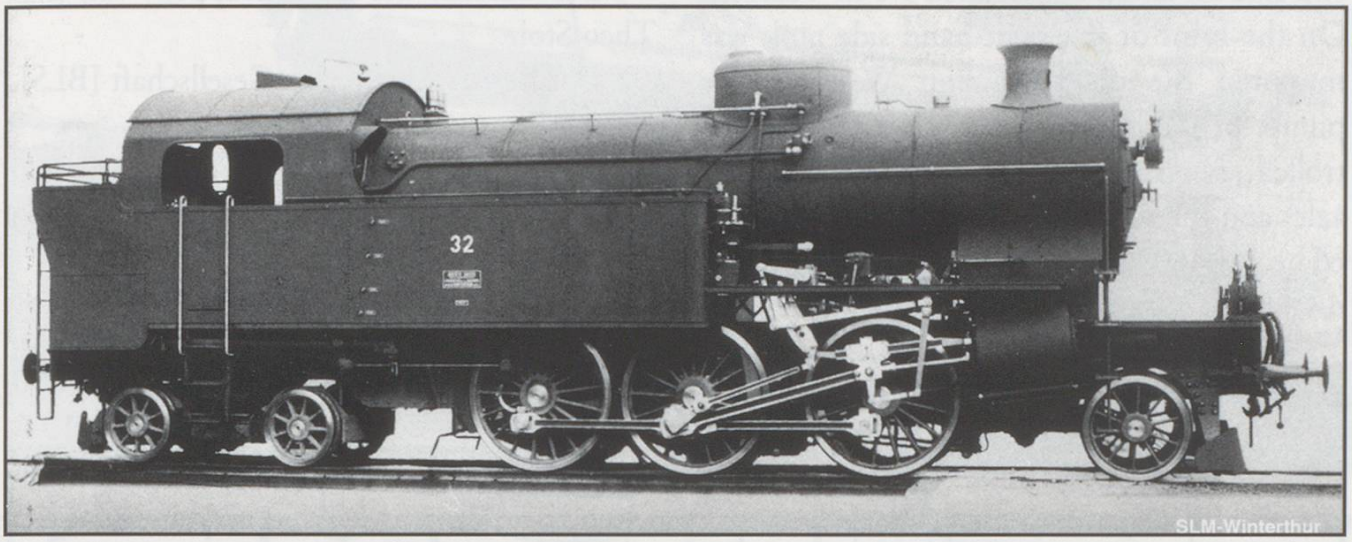
STEAM AROUND SWITZERLAND

PART 5 - BERN NEUENBURG BAHN EXPRESS PASSENGER LOCOMOTIVE TYPE E 3/6



The Bern Neuenburg Bahn or Bern Neuchâtel direct route via Kerzers to Neuchâtel was opened in 1901, when it was connected at Holligen to the SCB tracks on the south eastern side of Bern. With the opening of the first Simplon tunnel in 1906 followed by the inauguration of the Bern Lötschberg line in 1913 a more direct route - via the BN and the BLS - to Milan was created for traffic from east and central France. In 1913 the Paris - Italia Express started service via Pontarlier and Bern to Milan, and to haul this train the BN required a stronger locomotive. To this end the company SLM Winterthur built two tank locomotives of the type E 3/6, numbered 31 and 32 under works numbers 2 350 and 2 351. Just one year later the Paris - Milan service came to an end with the start of the First World War and it was to be several years before it recommenced. However, the E 3/6 remained in service as the principal express locomotive on this line until it was replaced by the electric locomotive in 1928, but worked on various duties until it was sent for scrapping in 1933.

The locomotives had to be able to haul a trailing load of 300 tonnes at 40 km/h over the route with its ruling gradient of 18‰. The E 3/6 - later reclassified as Ea 3/6 - was listed as a type "Adriatic or Pacific umgekehrt [reversed]" and was regarded to be one of the best proportioned steam locomotives to run on the Swiss railways. The design of the boiler, steam dome, cylinder arrangement and chimney of this locomotive was a precursor for the C 5/6 heavy freight locomotive that went into service shortly after the Ea 3/6.

A 4 500 mm long boiler operated at 12 bars and supplied wet steam to the 21 tube Schmidt superheater. A double slide regulator fed steam to the four cylinders, which had a bore of 425 mm and a stroke of 640 mm. Each of the two cylinder castings housed an inside and outside cylinder unit. The two internal and two externally mounted inclined - at 1:8 - cylinders, each fed with fresh steam and controlled by Walschaerts/Heusinger piston-valve gear, powered the central axle of the three coupled driving axles. Boiler safety was provided by two pop-valves located above the firebox. Sand from the large centrally-mounted steam/sand dome was fed to the central driving axle when travelling in either direction. The carrying-bogie was designed according to the Helmholtz principle. With a driving axle load-

ing of 18 tonnes this locomotive ranked the highest in the BLS group.

A coal bunker located on the rear of the driving cab had a capacity of 2·5 tonnes and two side mounted tanks stored 9·0 m³ of water. On the front of the right-hand side tank was mounted the double action Westinghouse pump for the brakes. This brake system controlled, via a single brake shoe/axle, the driving axles and the rear bogie, and was supplemented by a screw brake system that operated on the driving axles only.

Although this type of locomotive was withdrawn from service on the BN in 1933, several versions worked on many European railways up to 1976.

References used:-

Die Bahnen der BLS Gruppe. Vol. 2.1. Theo Stolz.

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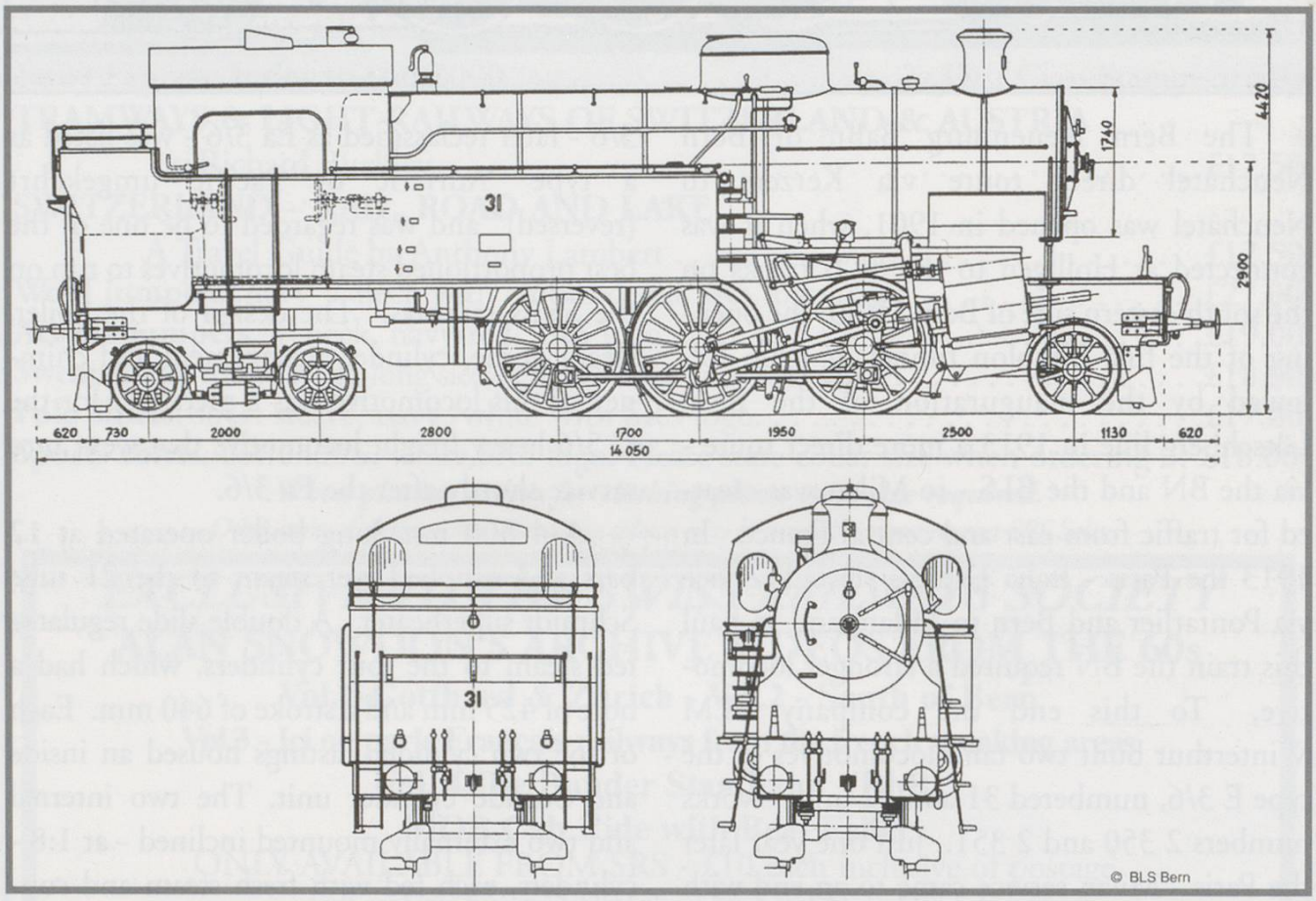
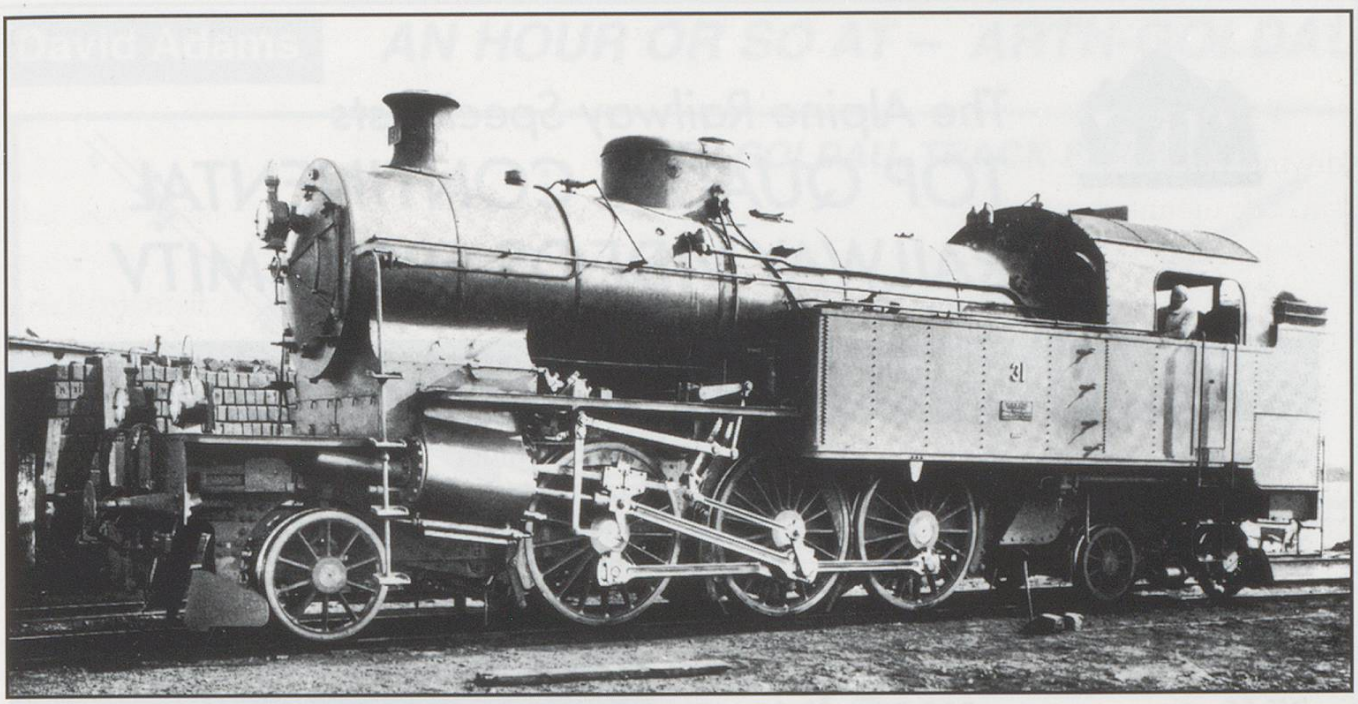
BLS Documents.

[n.b.] All figures are new standard with space separator



Locomotive Data.
Type Ea 3/6 ***Nos*** 31 & 32 ***Built by*** SLM ***Works No*** - 2 350 & 2 351
Date built 1913 ***Date in Service*** 1913 ***Date out of service*** 1933 Scrapped.
Power(HP) - 1 600 @ 45 km/h. ***Power(kW)*** - 1 176 ***T/E at wheel rim*** kN - 98·1
Speed maximum km/h 90 ***Speed Indicator*** Hasler
Driving wheels Diameter(mm - 1 600 ***Rigid Wheelbase(mm)*** - 3 650 ***Total wheelbase(mm)*** - 10 950
Length overall(mm) - 14 050 ***Height(mm)*** - 4 420
Loco weight(Tonnes) Empty - 69·3 Service - 879 Adhesion - 59·7
Water capacity - 9·0m³ ***Coal capacity(Tonnes)*** - 2·5
Brakes Westinghouse Double action Screw ***Cylinders*** No.4 Bore(mm) - 425 Stroke(mm) - 640
Boiler Operating pressure - Bars 12 Length(mm) - 4 500 Tubes - 164/21 Grate area m² - 3·0
Firebox heating area m² - 42·4 Superheater area m² - 12·7 Total Heating area m² - 210·7
Trailing load Gradient 10 ‰400 tonnes @ 60 km/h 18 ‰300 tonnes @ 40 km/h
Construction cost SFr114 500



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