

# Steam around Switzerland. Part 3, Jura-Simplon express passenger locomotive type A 2/4

Autor(en): **Hardy-Randall, Malcolm**

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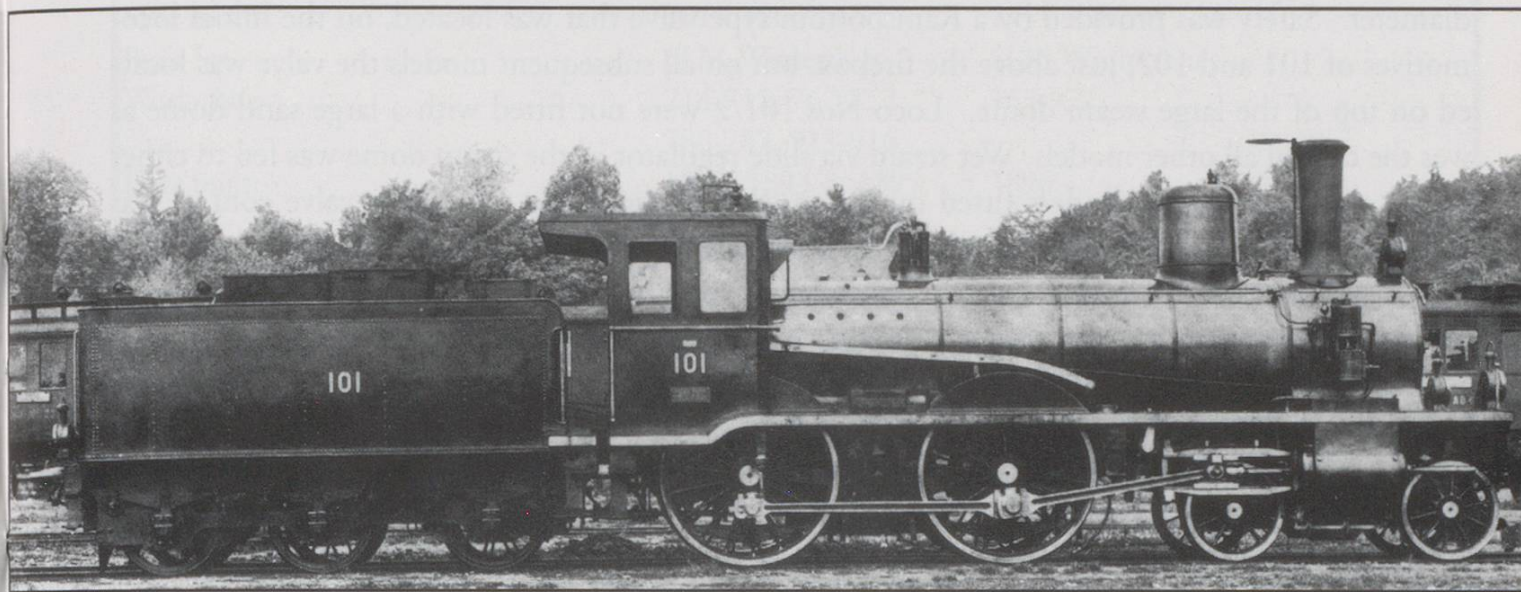
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**PART 3 - JURA-SIMPLON EXPRESS PASSENGER  
LOCOMOTIVE TYPE A 2/4**



The Jura Simplon Railway came into existence on the 1st January 1890, out of the amalgamation of many smaller railway companies that served the country from an area that covered from Brig to Geneva, Yverdon, Le Locle, Bern and Luzern. Over many of the routes within this huge network there was need for fast passenger trains, as in the rest of the country at this time passenger traffic in this area was on the increase. To satisfy the demand the Jura Simplon railway placed an order with SLM Winterthur for an express locomotive having the capability of hauling an express train of 180 tonnes trailing weight at 45 km/h.

The manufacturer SLM produced the A 2/4 able to haul up to 250 tonnes as a trailing load, and could achieve - subject to load - a maximum speed of ninety kilometres per hour. The thirty locomotives in this class were delivered in several batches over a time period of four years from 1892. Deliveries during 1892 were numbers 101/2 under works numbers 714/5 and 103/8 under works numbers 767/72. These were followed in 1893 with numbers 109/16 under works numbers 780/7. Then there was a two year gap before the delivery of the final part of the first order during 1895, of locomotives numbered 117/120 under works numbers 913/16. A year later another batch of locomotives numbered 121/30 under works number 963/72 was delivered, but these locomotives differed slightly from the earlier models. The entire class A 2/4 locomotives saw out their service life - up to 1924 - in their original form except for number 130 which received a replacement boiler in 1901.

The primary duty of these locomotives was to work the Geneva - Bern, Lausanne - St Maurice and the Lausanne - Biel - Basel routes. The locomotives performed well on these services as the performance on the Lausanne to Geneva service will bear witness. The stop to stop time allowed for the 60 kms was 64 minutes which meant that the locomotive and trailing load of 180 tonnes would have to attain a maximum speed in the 80 km/h range, with a ruling gradient of 10 per mille. This was regularly achieved and on one recorded occasion the locomotive reached a speed of 87 km/h. Locomotive number 116 was sent on the 10th November 1894 for speed and load trials lasting three days, on the Brunnen - Erstfeld section of the Gotthard. On the 11th November with a load consisting of Alsace-Lorraine 2-axle dynamometer No 1408 and four



Gotthardbahn type C4 2-axle coaches - trailing weight 126 tonnes - reached a maximum speed of 79 km/h on the Flüelen - Altdorf section with its ruling gradient of 12 per mille.

The A 2/4 compound twin cylinder locomotive was fitted with a boiler - length 3,800 mm and diameter 1,348 mm - operating at 12 bars and fitted with 224 tubes each measuring 41 mm diameter. Safety was provided by a Ramsbottom type valve that was located, on the initial locomotives of 101 and 102, just above the firebox, but on all subsequent models the valve was located on top of the large steam dome. Loco Nos.101/2 were not fitted with a large sand dome as was the case in all other models. Wet steam via slide regulator in the steam dome was fed to either of the two horizontal cylinders fitted on the outside of the frame. Cylinder valve control was according to the Stephenson principle. The three axle tender carried 6 tonnes of coal and 12.7 M3 of water. Speed indication was via a Haushalter speedometer fitted on the right hand side of the driving cab. Braking system was a double action brake supplemented by a screw brake.

Locomotives No.101 - 116 in the year 1894 achieved an average running distance of 61,009 kms - except number 104 which achieved 74,148 kms. Running cost worked out at 3,524 francs per locomotive in consumables. As a final comment on this locomotive class, it is worth noting that on the 23 August 1895 an A 2/4 on train number 10 lifted 240 tonnes out of Nyon bound for Geneva, and travelled the 22 kilometres in 16 minutes at a maximum speed of 82 km/h. This was with a load that was 80 tonnes over the tabled weight.

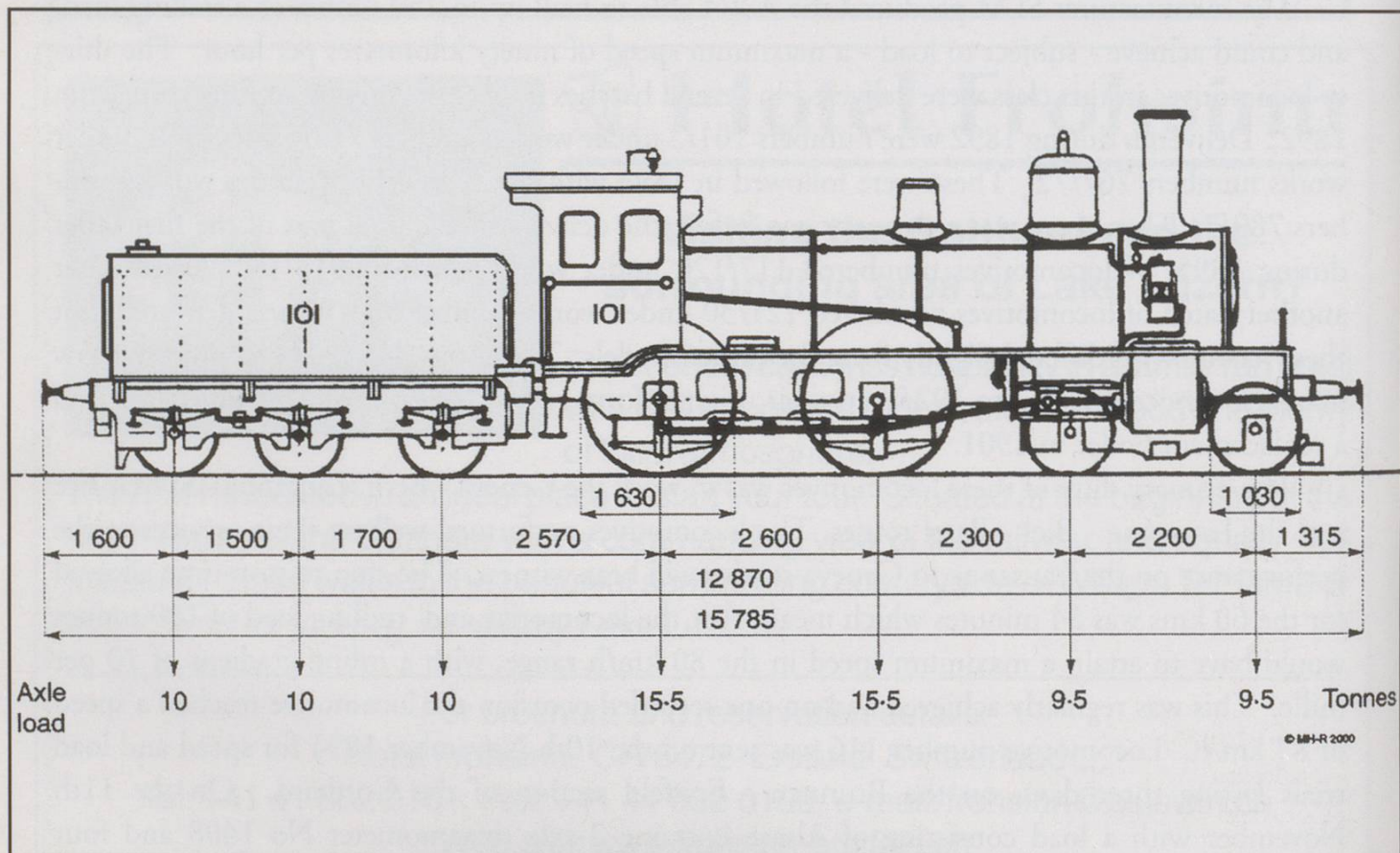
#### References.

Les Locomotives Suisse. 1896. Barbey.

Der Dampfbetrieb der Schweizerischen Eisenbahnen. 1847 - 1966 Moser

Photo. Von Hornstein collection.

Readers are also reminded of the cover photo from the last Swiss Express showing a JS A2-4.





**Locomotive Data.**

|                        |                    |                                      |                                   |
|------------------------|--------------------|--------------------------------------|-----------------------------------|
| JS Type:               |                    | A 2T                                 | A 2T                              |
| SBB Type:              |                    | A 2/4                                | A 2/4                             |
| Nos:                   |                    | 101 - 120                            | 121 - 130                         |
| SBB Nos:               |                    | 101 - 120                            | 121 - 130                         |
| Built by:              |                    | SLM Winterthur                       | SLM Winterthur                    |
| Works No:              |                    | 714-715, 767-772<br>780-787, 913-916 | 963-972                           |
| Date built:            |                    | 1892, 1893 & 1895                    | 1896                              |
| Power:                 | HP                 |                                      | 670                               |
| Power:                 | kW                 |                                      | 492                               |
| T/E at wheel rim:      | kN                 |                                      | 39.24                             |
| Date in Service:       | 1892               | 101-108                              |                                   |
|                        | 1893               | 109-116                              |                                   |
|                        | 1895               | 117-120                              |                                   |
|                        | 1896               |                                      | 121-130                           |
| Date out of service:   | 1917               | 101-2, 104 & 120                     | 122                               |
|                        | 1924               | 103/5,8/11/13/15,16/1819             | 124-7/30                          |
|                        | 1925               | 104                                  | 129                               |
|                        | 1926               | 109/17                               | 128                               |
| Speed maximum:         | km/h               | 90                                   |                                   |
| <b>Driving wheels:</b> | Diameter:          | mm                                   | 1,830                             |
|                        | Rigid Wheelbase:   | mm                                   | 2,600                             |
|                        | Total wheelbase:   | mm                                   | 7,100                             |
|                        | Length overall:    | mm                                   | 15,785                            |
|                        | Height:            | mm                                   | 4,375                             |
| <b>Loco weight:</b>    |                    |                                      |                                   |
| Empty:                 | Tonnes             | 58,9                                 | 58,4[48,4 with new boiler]        |
| Service:               | Tonnes             | 82,1                                 | 81,7                              |
| Adhesion:              | Tonnes             | 29,8                                 | 29,8                              |
| Water capacity:        | m <sup>3</sup>     |                                      | 12,7                              |
| Coal capacity:         | Tonnes             |                                      | 6                                 |
| Brakes:                | Westinghouse/Screw |                                      |                                   |
| <b>Cylinders:</b>      |                    |                                      |                                   |
| Number:                | LP                 | 2 Horizontal                         | 2 Horizontal                      |
| Bore:                  | mm                 | 450                                  | 670                               |
| Stroke:                | mm                 | 650                                  | 650                               |
| <b>Boiler:</b>         |                    |                                      |                                   |
| Operating pressure:    | Bars               | 12                                   | 12 [14 New boiler on 130 in 1901] |
| Length:                | mm                 | 3,800                                | 3,800 [3,600 New boiler]          |
| Tubes:                 |                    | 224                                  | 224 [197 New boiler]              |
| Firebox:               | m <sup>2</sup>     | 2,0                                  | 2,0 [2,2 New boiler]              |
| Grate area:            | m <sup>2</sup>     | 9,3                                  | 9,3 [9,9 New boiler]              |
| <b>Trailing load:</b>  |                    |                                      |                                   |
| Gradient:              | 10‰                |                                      | 180 tonnes @ 45 km/h              |
| Construction cost:     | SFr                | 73,500                               | 79,300                            |





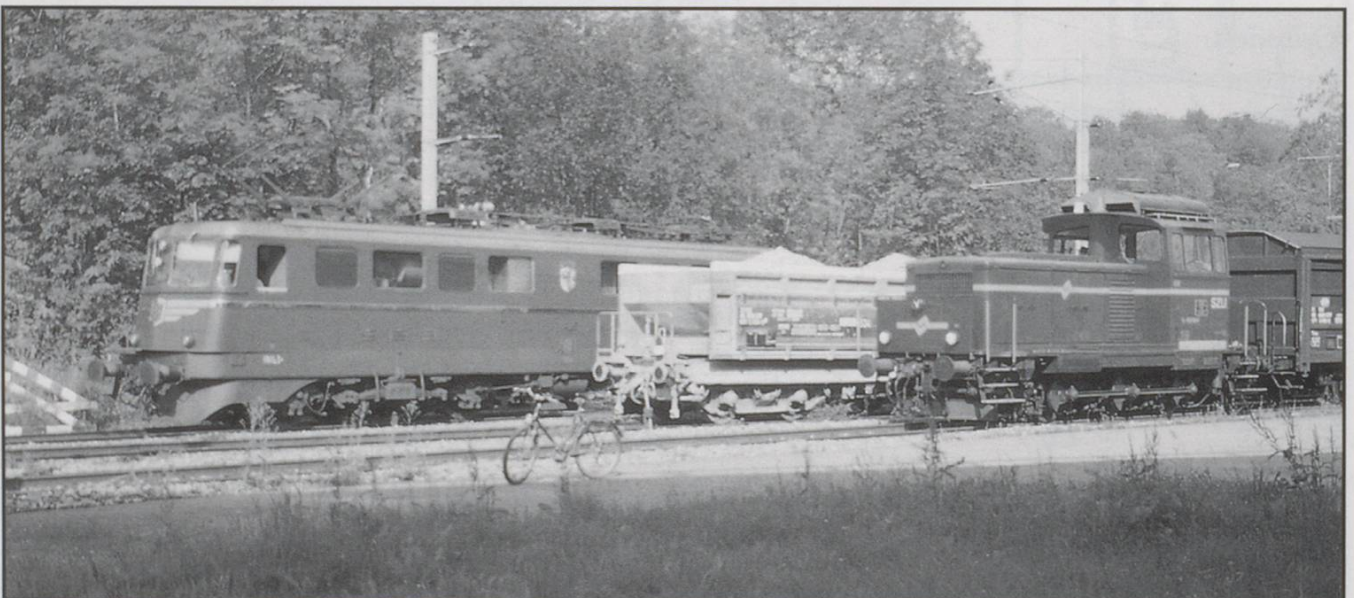
*Above: The rear of a typical SZU train, an NPZ Bt of 1986 at Langnau-Gattikon awaiting departure. 23/5/97*



*Centre: SZU Em3/3 no.6 shunts at Zürich Brunau. 25/8/99*

*Below: SBB Ae6/6 11425 and SZU Em3/3 no.6 at Zürich Brunau. 25/8/99*

*All pictures by Steve Barnes*







*Above:* A typical SZU pendelzug headed by Re4/4 46 awaits departure at Sihlbrugg, 23/5/97. *Below:* The same train in a sylvan setting south of Langnau.

## PHOTO GALLERY THE SZU SIHLTAL LINE

