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The international border is at 9.06 km from the northern end, not far from the highest point of the tunnel. A plaque is fixed to the wall to mark the border, and carries the Swiss and Italian coats of arms and the words *Suisse* and *Italia*. The Simplon was the last of the major

Alpine tunnels to be built. With the prospect of even more massive, low-level, tunnels under the Brenner, Gotthard and Lötschberg, it was felt to be a suitable time to recount the difficulties which faced the builders at the turn of the century.

Technical details of the 3-phase locomotives used through the Simplon tunnel:-

Class	Fb3/5 (361-3)	Fb3/5 (364-5)	Fb4/4 (366-9)	Fb4/6 (371)
Years built	1904	1906	1907/8/20	1914
Wheel arrangement	1-C-1	1-C-1	-D-	1-D-1
Total length (mm)	11,540	12,304	11,640	12,500
Total wheelbase (mm)	9,500	9,700	8,000	8,800
Coupled wheelbase (mm)	4,700	4,900	8,000	4,800
Driving wheel dia. (mm)	1,500	1,640	1,250	1,250
Pony wheel dia. (mm)	850	850	-	850
Total weight (tonnes)	62	62	68	90.3
1 hour rating (kW)	?	662	1,250	2,060
Tractive effort (kg)	?	9,000	13,000	17,000
Speeds (km/h)	35/70	35/70	26/35/53/71	26/35/53/71

Sources differ slightly regarding weights. The class Fb4/4 are alternatively shown as weighing in at 69 or 70 t. and the solitary Fb4/6 at 88.4 or 91 t. One source quotes the length of 364 & 365 as 12,320 mm. Traction units working on the three-phase system do not have the variable speed range available to later systems. Instead, they have a limited range of maximum speeds. If the load of the train, or the gradient, causes the locomotive to be unable to maintain the speed set by the driver through the switching apparatus, the driver has to set a lower speed to avoid overheating. The once-extensive Italian 3-phase system was well-known for the sight of boiling electric locos!

**Bibliography**

*Railways of the World*  
*Railways through the Mountains of Europe*  
*The History of the Electric Locomotive*  
*SBB Nachrichtenblatt*

*F.A.Talbot*  
*A.Schneider*  
*F.J.G.Haut*

In particular, I would like to thank Herr Lang of ABB Transport Systems for the photographs of the 3-phase locomotives.

**SBB Stock News**

*New locomotives up to the end of November 1993:*  
 Re 4/4 450.059, 066, 067, 068, 069  
 Re 4/4 460.021-023, 053, 056-068, 070, 072  
 Am 842.000  
 XTms 88100

*Withdrawn:*  
 Re4/4<sup>l</sup> 10047 (accident)  
 Ae4/7 10960  
 Ae3/6<sup>l</sup> 10680  
 BDe4/4 1647  
 Ee3/3 16320  
 Tm<sup>ll</sup> 814