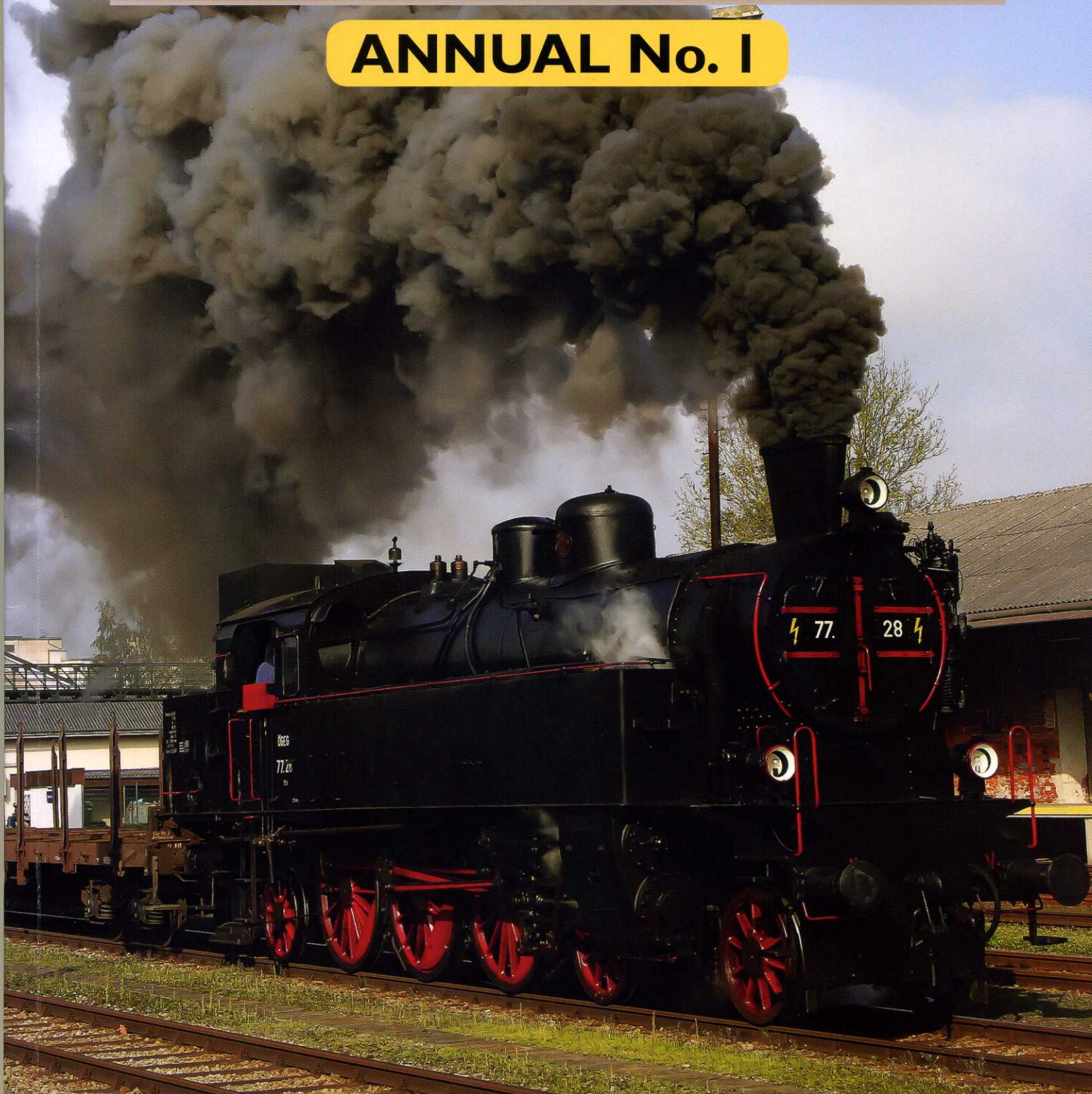


# LOCOMOTIVES INTERNATIONAL

**ANNUAL No. 1**



**Featuring: 1970s INDIAN NG - CUBA - BOLIVIA - MILWAUKEE 100  
GARRATTS IN ZIMBABWE - STEAM IN THE BALTICS  
DOURO VALLEY - GERMANY FIRELESS - AND MORE!!!**



# A GERMAN FAKULTATIVWAGEN IN THE SOVIET FORESTS

by David Scotney



The forest areas of the USSR were huge: some 700 million hectares compared with around 250 million hectares in the USA and 145 million hectares in the rest of Europe<sup>1</sup>. Forestry in the USSR was served at its peak in the 1950s by over 700 forestry railways with some 50,000km of route.

About half of the USSR forestry railways were managed by the Ministry of the Timber Industry, roughly half by the Ministry of Internal Affairs (as part of its 'Gulag' prison empire) and a few lines by various other industrial Ministries. These railways were all predominantly standardised in terms of gauge, 0.750m, and in all types of equipment. Much of the equipment was indeed the same as that to be found on other Soviet industrial railways and on public 0.750m lines.

However one piece of rolling stock seen in pictures of many forestry, peat and other industrial railways does not seem to match the other standardised stock: a slightly odd-looking box car with windows. This is what we are considering here!

## What is a 'Fakultativwagen'?

From the earliest days of railways open goods wagons have been used at times of peak or unusual demand, on an ad-hoc basis, to carry passengers. The wagons have not usually been specifically constructed for this additional role, although they have sometimes been temporarily adapted with plank seating etc.

A classic view of a USSR *Fakultativwagen* in the forests on the Alapaevsk Railway in 2010. This example has been somewhat rebuilt over the years.

V. Demyanchenko

There have however been some limited instances where a few open wagons have been specifically equipped for this convertible role. Two examples of bogie wagons, intended for excursion/tourist traffic in the early years of the 20th Century, which could be fitted with removable seating, safety rails, canvas roofing, etc. were to be found on the 2ft 6in gauge Victorian Government Railways Gembrook and Valhalla lines (Australia)<sup>2</sup> and Leek & Manifold Valley Light Railway (GB)<sup>3</sup>.

However in Germany a more established need was identified by both the main railways and the military for a combination vehicle which could be used as a box/luggage car or as a passenger coach as traffic and circumstances required. The compromise vehicle which emerged in the 1890s had:

- a van body, with a few small windows fitted between the external timber body framing, on four-wheels;
- sliding side access doors for luggage/freight use;
- open end platforms for passenger access with doors from the platforms into the ends of the van body;
- removable seating within the van body transversely in blocks either side of a central aisle for 4ft 8½in gauge or longitudinally along the sides for narrower gauges; but
- no form of heating since any passenger use was envisaged as being primarily in the summer months.





A restored 1890 De Dietrich-built *Fakultativwagen* for the standard gauge Reichseisenbahn Elsaß-Lothringen (Alsace-Lorraine Imperial Railway), which came to the Minden Kreisbahnen in the 1920s, at Minden-Oberstadt station in 2009.

J. Fricke

The resultant vehicle had much in common with contemporary German four-wheel *Gepäckwagen* ('Pwg' - luggage cars), *Gedeckter Güterwagen* ('G' - Covered vans), and Third ('C') and Fourth ('D') Class Passenger Cars (although Fourth Class cars did not always have any seats). The vehicle gained the name of '*Fakultativwagen*' (optional / multiple use cars), '*Wechselwagen*' (changeable car), or '*Gedeckter Güterwagen mit Einrichtung zur Personenbeförderung*' (covered van with the capability of carrying passengers) - and most gained the letter designation 'GC' (*Gedeckter Güterwagen* / 3rd Class Passenger Coach with end platforms). They were mainly constructed in the period up to WWI<sup>4</sup>.

*Fakultativwagen* were used by four of the main pre-WWI German state railways, Prussia, Saxony, Bavaria and Oldenburg<sup>5,6</sup>, where they were mainly operated between 1890 and 1920 on branch services (although the 250 cars in Saxony were primarily kept as a reserve for military purposes). In addition a number of the secondary lines equipped / operated by the Lenz organisation and its associated companies also had *Fakultativwagen* delivered in the 1895-1912 period<sup>7,8</sup>, as well as some ADKG lines<sup>9</sup>. Even a few smaller independent lines recognised the utility of *Fakultativwagen*, these included: the 0.600m Mecklenburg-Pommerschen Schmalspurbahn (MPSB) with fourteen supplied in 1909-11<sup>10</sup>; and the short standard gauge Lehniner Kleinbahn in Brandenburg with a single *Fakultativwagen* delivered in 1924<sup>11</sup>.

*Fakultativwagen* were built by a number of different suppliers to very similar designs, these included: Bautzen (Westpreußische Kleinbahnen (0.750m) 1913); Beuchelt / Grünberg (Demminer Kleinbahn Ost (0.750m) 1906, Greifswald - Jarmener Kelnbahn (0.750m) 1906/11, Kleinbahn Greifswald - Wolgast (0.750m) 1906/7/8/11); Glässsing & Schollwer (MPSB (0.600m) 1909/1911<sup>12</sup>); Görlitz (Rügensche Kleinbahn (0.750m) 1895-97 and Lehniner Kleinbahn 1924); and Steinfurt (Demminer Kleinbahn West (0.750m) 1912).

The 14 cars supplied to the Mecklenburg-Pommersche<sup>13</sup> however seem to have differed somewhat from other *Fakultativwagen* in that they were on bogies and had only a single open end platform for passenger access. Indeed the relatively large number of *Fakultativwagen* on this railway constituted about two-thirds of the passenger coaches or alternatively two-thirds of the *Gepäckwagen*<sup>14</sup>.

Many *Fakultativwagen* seem to have survived for local freight and, later, railway-own use in various Germany-successor areas until late in the 20th Century. A few examples have even survived into preservation. In addition a number of the 0.750m gauge *Fakultativwagen* on lines in the parts of pre-WWII Germany which came under the control of the USSR at the end of WWII were claimed as reparations and moved to industrial lines in the

USSR. Some of these remained at places like the major peat line at Shatura until the 1980s.

Between the World Wars the Deutsche Reichsbahn did not have any *Fakultativwagen* built among its highly standardised four-wheel *Einheitswagen* ('Donnerbüchse')<sup>15,16</sup>, passenger vehicles or *Austauschbauart*<sup>17,18</sup>, freight wagons. However in the latter part of World War II over 5,000 four-wheel *Behelfspersonenwagen* (MCI)<sup>19,20</sup>, 'temporary' passenger vehicles, normally with 52 seats, were constructed as a modification of the newly-designed 'Leipzig'-type freight car (with the sliding side loading door replaced by wooden panelling, six small windows per side between the wagon framing and access through end doors from narrow end platforms). There were some variations on the standard design and a few *Behelfspersonenwagen* were constructed as *Fakultativwagen*-type cars with 55 seats on benches which could be folded to allow an alternative use as a freight car.



Former German 'Reparations' 0.750m *Fakultativwagen* in use on the Shatura peat railway network in the 1980s.

V. Mironov

## The need

At the end of WWII the USSR had a major problem: much of its timber extraction and other industrial infrastructure had been destroyed in the conflict (including a half of all its narrow gauge forestry locomotives)<sup>21</sup> and these resources were now required urgently to help in rebuilding its shattered economy. This required a large increase in the production of, among many other things, industrial narrow gauge railway equipment.

Examples of *Fakultativwagen* had been seen by Soviet personnel as they swept across Germany in 1944/5 and their utility for industrial railway use was quickly recognised: as has already been noted 0.750m gauge examples were brought back to the USSR, among much other equipment, as part of the reparations process. This type of rolling stock obviously had great potential for the burgeoning and lengthening forestry lines, as well as other expanding industrial lines, by providing a simple but practical means of carrying workers, equipment and supplies from external access points to accommodation and work sites. A new-build *Fakultativwagen*-type vehicle, to augment and modernise the limited supplies of reparation *Fakultativwagen*, would seem to have great potential as part of the new railway equipment to be provided to Soviet industry.

Existing Soviet railway plants were operating at full capacity to cater for mainline railway requirements and could only cope with limited additional demands for narrow gauge equipment. The Soviet planners therefore had to look elsewhere to cope with much of their industrial narrow gauge requirements.

## East Germany Industrial Capacity<sup>22</sup>

At the end of the War the area which was to remain Germany was split into four areas of occupation between the USSR, USA, Great Britain and France. In addition the occupiers had also



agreed that the industry within that area should be reduced to remove any future 'war potential' and to provide reparations to 'pay in kind for the losses caused'. The agreements on these matters were made at conferences at Yalta in February 1945 and Potsdam in July/August 1945.

The future area of Germany was gradually occupied by invading troops from late 1944 until the Armistice was signed on 7 May 1945. There was some ad-hoc local military administration established from the start of the occupation, but it was not until June 1945 that the Soviet Military Administration (SMA) was established and over the next few months took overall control of the *Sowjetische Besatzungszone* (SBZ – Soviet occupation zone).

There was considerable established industry within the SBZ, a proportion of which was relatively undamaged. Under the occupation agreements some of this was to be dismantled and transferred to the USSR, some was to be operated within Germany by the USSR and some would remain under German management but would be required to deliver a proportion of production to the USSR.

A number of railway works fell within the SBZ, and seemingly arbitrarily they were allocated between the three categories (and were also subsequently moved between them) e.g.:

- Works which were predominantly dismantled were: in 1945 the 'Orenstein & Koppel' Babelsberg locomotive works<sup>23</sup>, the Bautzen wagon works<sup>24</sup> and the Görlitz wagon works<sup>25</sup>; and in 1947 the Gotha wagon works (as a SAG (see below)). At the end of the dismantling the remnants of all these Works were then passed to local provincial administrators who re-established production (see below).
- The 'Gottfried Lindner' Ammendorf wagon works 1945-1952<sup>26</sup>, the Bautzen wagon works 1946-1947<sup>27</sup>, Gotha wagon works 1946-dismantled-1947<sup>28</sup>, Dessau wagon works 1946-1952<sup>29</sup>, Weimar wagon works 1946-1952<sup>30</sup> operated as 'Sowjetische Aktiengesellschaften' (SAG – Soviet Corporations) under the general direction of 'SAG Transmasch' (covering railway and road rolling stock works). The senior management within the SAGs was undertaken by Soviet expatriates, with German junior managers and workforce. The SAGs were all ostensibly controlled by a Soviet holding company based in Berlin but seem to have been operated in functional industrial groups linked to the requirements of comparable 'parent' groups within the USSR.
- The following works were locally managed from: 1945 - Vetschau wagon works<sup>31</sup>; 1946 - 'Christoph & Unmack' Niesky Wagon Works<sup>32</sup>, Görlitz wagon works<sup>33</sup> and 'Orenstein & Koppel' Babelsberg locomotive works<sup>34</sup>; 1947 - 'AEG/Borsig' Hennigsdorf electric locomotive works<sup>35</sup>, Bautzen Wagon Works (ex SAG)<sup>36</sup> and Gotha wagon works (ex SAG)<sup>37</sup>; and 1952 (transferred from SAG operation with a compensation payment from East Germany to the USSR) - Dessau wagon works<sup>38</sup>, 'Gottfried Lindner' Ammendorf Wagon Works<sup>39</sup> and Weimar wagon works<sup>40</sup>. Some of the works initially came under provincial management but were gradually nationalised as 'Volkseigener Betrieb' (VEB) under the supervision of the 'Vereinigung Volkseigener Betriebe des Lokomotiv- und Wagonbaus' (VVB LOWA – 'Association of publicly owned enterprises for locomotive and wagon construction' – with various name changes thereafter). The only exception was the Weimar wagon works which shortly after transfer from SAG operation became 'VEB Mährescherwerk Weimar' ('VEB combine-harvester works Weimar')<sup>41</sup> and converted to the production of agricultural machinery.

The USSR seems to have decided to use their (SAG) wagon works at Ammendorf and Weimar to primarily supply industrial narrow gauge rolling stock to the USSR from 1945/6 through to their translation into East German VEBs in the early 1950s (and it seems likely for a little time beyond this). The wagons supplied by these works seem to have included bogie open and low-sided wagons, timber carriers and various types of bogie van<sup>42</sup>. The SAG wagon works at Bautzen also supplied

insulated / refrigerated narrow gauge vans.

The SBZ became a separate state in 1949 as the *Deutsche Demokratische Republik* (DDR) which then took control of all the VEB enterprises (including VVB LOWA).

### A 'Комбинированный Товаро-Пассажирский Вагон' (A 'Combined Freight-Passenger Wagon')

So the USSR decided in 1945 to built what was described as 'Combined Freight-Passenger Wagon' for its expanding industrial railways at its wagon-building SAG plants at Ammendorf and Weimar.

Only a few classic *Fakultativwagen* had been built since the First World War and its design was somewhat dated with open end balconies and four-wheel suspension. So a design was required which achieved the *Fakultativwagen* concept, fitted the USSR standard dimension requirements, met USSR weather constraints, met contemporary expectations, but used the established and currently available construction materials and methods within the SBZ.

So what were the design constraints in terms of size? The maximum vehicle cross-section for 0.750m track in the USSR was 2.550m wide to a height of 3.035m above rail level and then reducing to 1.480m width for the central maximum height of 3.550m. Most narrow gauge vehicles of a practical length (>7m) were carried on bogies to cater for the potential track curvature: in the USSR new passenger cars and wagons built between the Wars varied between about 7m and 11m. The centre of the standard buffer/coupling at the ends of the cars were 0.620m above rail level. These relatively generous proportions would seem to have controlled the size of the vehicle.

So what should a new 0.750m USSR *Fakultativwagen* consist of? If we look back at the original list, this modernised version would be likely to be composed of:

- a van body, with a few small windows fitted between the external body framing, on bogies (instead of four-wheels);
- sliding side access doors for luggage/freight use;
- end vestibule(s), replacing open end platforms to provide maximum weather protection and reduce any heating loss in USSR conditions, for passenger access with doors from the vestibule(s) into the ends of the van body (possibly only at one end to reduce 'wasted' space, as in the MPSB examples);
- seating within the van body along the sides, outside the areas of the sliding doors, hinged to allow folding against the sides (possibly with the ability to also provide rudimentary sleeping accommodation); and
- a form of heating since the vehicles would need to be used all year in USSR weather conditions.

From 1909 there was a high level of standardisation of 4ft 8½in gauge railway vehicle construction within Germany under the succeeding *Deutscher Staatsbahnwagenverband* (DSV)<sup>43,44</sup>, *Austauschbauart*<sup>45,46</sup>, *Einheitswagen*<sup>47,48</sup>, and *Kriegsbauart*<sup>49,50</sup>, definitions. These effectively controlled the types of wagons and cars constructed and indeed how they were constructed. The various rail vehicle construction plants therefore undertook little new design or specification work themselves, mainly undertaking only the construction to established drawings. In 1945 the design of a new novel vehicle must have therefore seemed somewhat daunting for Ammendorf and Weimar Works: so it must be presumed that they considered how the German 'standard' designs could be utilised or modified.

So what was the actual design of the USSR *Fakultativwagen*? The main aspects can be seen from the drawing and the illustrations, but some aspects are worth noting:

- it was carried on diamond-frame bogies of 1.02m wheelbase – which were copied from pre-WWII USSR standard patterns derived from USA designs transferred in the period of close industrial collaboration between the USA/USSR in the late-1920s and early-1930s (1.02m=40") – some bogies had leaf-springs to provide a more comfortable ride (which may well have been

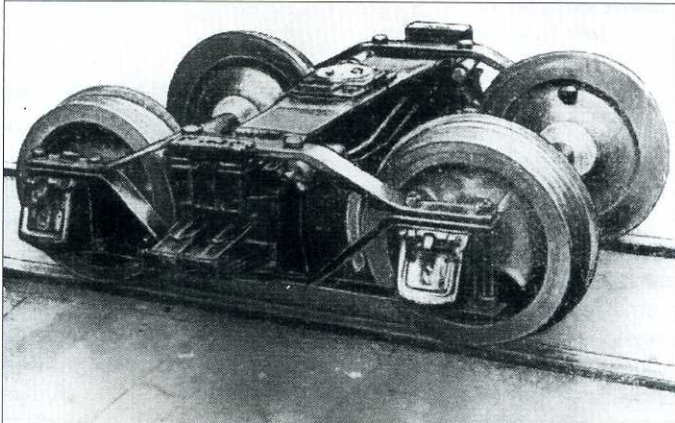


Works picture of the exterior of a USSR Fakultativwagen.  
Ammendorf Works



derived from the similar standard German *Verbandsbauart B23*<sup>51</sup> 2m wheelbase design of 1913) and others had more normal coil springs;

- the bogie centres were spaced at 4.5m but, strangely, placed 1.99m and 1.25m in from the ends of the main frames (of length 7.74m) – this would seem to have been a ‘compromise’ placing between the German approach of ensuring that wheel/bogies were always placed at the same distances from the frame ends and the USSR approach of maintaining the wheel/bogie placing at the same distances from the end of the loaded section (and not allowing any changes to allow for braking platforms etc. outside the loaded section) – whatever was the reason this must have



Diamond frame bogie with leaf springs.

Ammendorf Works

Diamond frame bogies with coil springs at Talitsy (Pereslavl Railway Museum).

S. Dorozhkov



caused somewhat different overhang characteristics at the two ends on tight curves, although the large single buffer and parallel coupling chains should have overcome any potential buffing problems;

- the body sides were composed of external steel framing of panels with horizontal wooden planking infill as on most contemporary freight wagons, however some of the panel dimensions seem to have been quite close (if not the same) as those found in some of the *Staatsbahnwagenverband / Austauschbauart / Kriegsbauart* freight designs, although the framing itself seems to have been to a lighter steel section than in these designs and the sizes of planking used were somewhat variable (both of which being potentially affected by the availability of materials at the time);

- the actual body cross-section (width, height and arc roof shape) did not match comparable vehicles in either the USSR or Germany, but the body shape above the main frame had a quite close correspondence with the small standard gauge profile used in the *Austauschbauart / Kriegsbauart* designs for the ‘Trier’ (*Gfh*) / *Gfkhs* / ‘Saarbrücken’ (*Gbh*) *Fährbootwagen*<sup>52,53</sup>, designed for use on the train ferries between Zeebrugge (Belgium) and Harwich (England) (300 *Gfhs* were built in 1926-28, 50 *Gfkhs* (refrigerated) in 1935 and 4 *Gbh* in 1940);

- the body ends were also composed of external steel framed panels with horizontal wooden planking, but the actual pattern of the steel framing differed somewhat between vehicles – some had a horizontal steel element at the level of the side walls as on the *Fährbootwagen* while others did not have this element and thus were more like the standard *Austauschbauart / Kriegsbauart* designs;

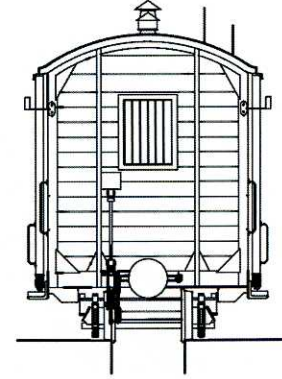
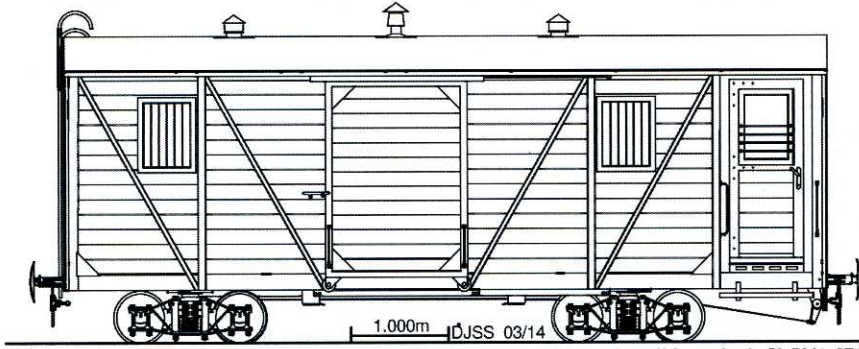
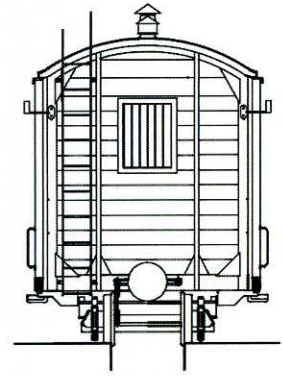
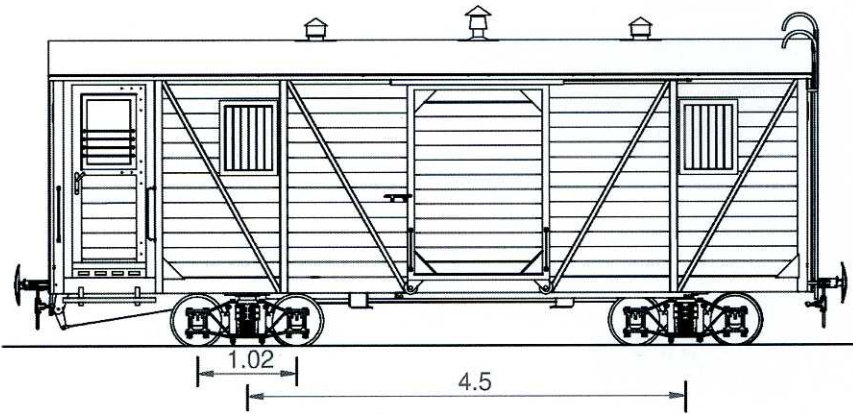
- passenger access was only available by side doors to a cross vestibule at one end of the car – like the single-ended access to the standard *Austauschbauart / Kriegsbauart Gepäckwagen*;

- the interior of the body was split into two areas (once again somewhat like the *Austauschbauart / Kriegsbauart Gepäckwagen*) – a cross vehicle vestibule with external doors both sides (both with windows), a window and brake wheel in the external wall and another door in the internal wall into the main portion of the car (the width of the vestibule was 0.975m – a strange, somewhat excessive, width which does not seem to have any equivalence in any German/USSR freight or passenger vestibule/end platform designs – although this may be explained further below); the main section of the car was accessed internally from the vestibule for passengers/ staff and for freight externally by two sliding doors in the middle of each side, two small windows were provided in each side and one in the end, a stove was provided in the middle of the floor (vented through the

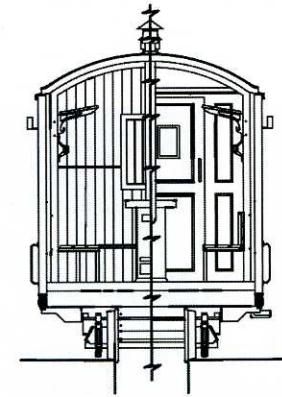
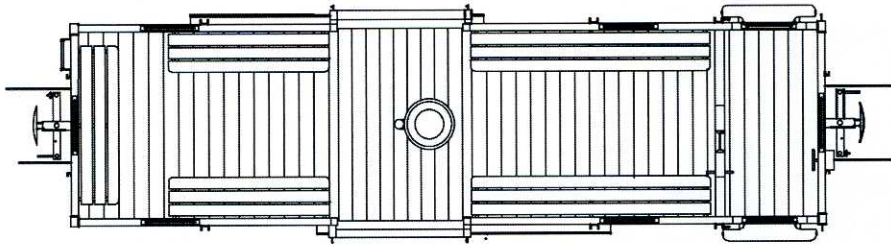
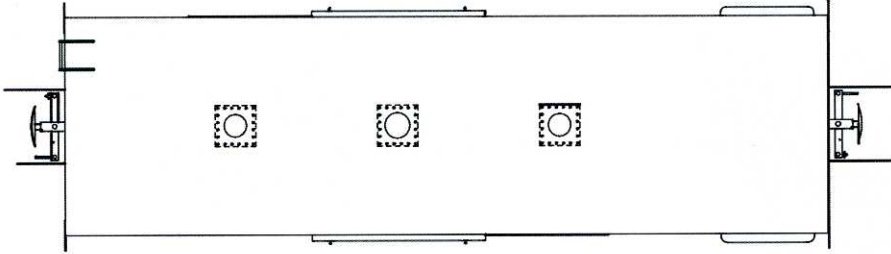


# USSR 0.750m Gauge - 'Fakultativwagen'

## [Combined Freight-Passenger Wagon]



From: Data on - '<http://scaletrainsclub.com/board/viewtopic.php?f=52&t=3745>'  
 Photographs on - '<http://narrow.parovoz.com/indexe.php>'





roof), ventilation was provided by two ceiling-mounted fans, and lighting was by candle (the actual length of the main section was some 6.4m although due to the space taken by the drop-down seats etc a loading length of only 6m was claimed);

- seating was provided for 22 people on drop-down plank-type bench seats along the sides and across the end opposite the vestibule (with fixed luggage racks above) of the main part of the body;
- rudimentary sleeping accommodation was available for 20 people<sup>54</sup> on removable planks of timber placed across the car and supported by a timber rail, above the collapsible seats and below the luggage racks, and the seat themselves (the planks were stored in a 'loft' above the vestibule accessed from the main body of the car – the 'excessive' width of the vestibule may have been required to safely store the length of these planks) – however this potential sleeping facility was not particularly mentioned in Soviet descriptions of these cars; and
- a somewhat flimsy ladder to the roof was provided on some of the cars on the left hand side of the non-vestibule end of the car and various patterns of bars (horizontally, vertically, external, internal etc) were provided at the windows in different versions of the car.

### Main Dimensions etc.

• Length over buffers -	8.527m
• Overall width -	2.450m
• Maximum height above rail level -	3.080m
• Centre buffer above rail level -	0.620m
• Bogie centre -	4.500m
• Bogie wheelbase -	1.020m
• Wheel diameter -	0.500m
• Seating capacity -	22 persons
• Sleeping capacity -	20 persons
• Unladen weight -	7t
• Load capacity -	6t
• Brakes -	Hand (from wheel in vestibule)

### Delivery & Use

The USSR *Fakultativwagen* seem to have been constructed between 1945 and 1954. The actual number is believed to have been about 500; but how many came from Ammendorf or Weimar, and when, cannot at present be identified.

Another complication to these delivery details was that the two plants produced simultaneously two other types of vehicle, also for industrial railway use, with a similar cross-sectional profile: a mobile workshop and a moveable steam-powered electricity generating station. The door and window layouts of these other two vehicles obviously did not correspond to those in the *Fakultativwagen*; and in addition there were a number of other external variations such as both having internally framed sides and the workshop car having a small crane at one end.

The USSR *Fakultativwagen* was delivered to industrial railways across the USSR from the Ukraine to Sakhalin Island. Many examples can be found in the images on Dmitry Zinoviev's website: <http://narrow.parovoz.com/indexe.php>

In use the vehicles met some level of modification on many of the industrial railways to meet their individual needs. The modifications included:

- Removal of the stove, chimney and ventilators;
- Recovering the roof with strips of roofing felt of varying widths;
- Replacing the diamond-frame bogies with plate-frame types transferred from Demikhovo-built coaches;
- Covering the windows (both at the sides and/or at the ends);
- Removing the sliding side freight doors;
- Replacement of the sliding side freight door by hinged doors;
- Covering the wooden planking (in whole or part) with sheet

metal panelling;

- Removal, or boarding up of the vestibule 'passenger' doors (and removal of inside wall between the vestibule and the main body area); and
- The conversion of the vestibule to an open balcony layout (although there is also photographic evidence that some *Fakultativwagen* may have been constructed like this as 'luggage/brake vans' for the Pamirskaya line in Tajikistan).

Over time the USSR *Fakultativwagen* proved to be an interim solution for the forestry railways and they were relatively soon replaced by more modern vehicles, not intended for mixed use, which were constructed in the USSR from the 1950s onwards. The main types of replacement were:

- The Demikhovo-built PV40/PV51 integral bogie coach with 40 seats which was built in large quantities (>7,000) between 1954 and 1989 for both industrial and public railway use (and which must have been far more comfortable for passengers in terms of style of seating and with no draughts through side doors); and
- Various models of high capacity (16.5t / 20t) bogie wagons built in considerable quantities from 1954 onwards by both the Demikhovo and Altai works initially for public railway use but later also for industrial use.

Many *Fakultativwagen* lingered on in use for more prosaic functions than those for which they were originally intended. Indeed examples have been found in a variety of roles such as:

- As storage sheds (either still on rails or 'grounded' without bogies); or
- As 'grounded' bodies used for various functions (from hunters' bothies to boat-houses).

One surviving example was found recently by hikers in the middle of a Ukrainian forest still on rails but on an abandoned length of track now cut off from the end of a former forestry railway.

One *Fakultativwagen* did not get to the USSR. In the late 1940s there was lobbying by senior German officials within the SBZ for some of the narrow gauge cars being built within the SAGs to be made available for Kleinbahn in the area. Indeed 69 wagons were allocated for German use and this included one *Fakultativwagen*. Thus in 1949 the Luckenwalde – Jüterbog Kleinbahn received a *Fakultativwagen* (classified C/GGw) numbered 2397 by the Landesbahnen Brandenburg and later 77-71-57 by the DR. The car passed to the Braunkohlenwerk Regis-Breitungen in 1965 on the closure of the Kleinbahn.

### Context

The USSR *Fakultativwagen* was an enigma. While it offered the multi-use functionality of the German *Fakultativwagen*, its design was a modernised variation of the 'classic' version of the latter type (which was indeed a pre-1914 design). The car was required to help rebuild the USSR after 1945 but, due to the resultant restricted industrial capacity available in the USSR, it had to be built in the factories of its former adversary. Those factories were however used to delivering standardised standard gauge wagons and they therefore had to amend these requirements to meet the Soviet requirements. There were elements in its design drawn from the USSR, Germany, USA and, possibly, GB!

In the early 1950s USSR industry had begun to catch up with the demands placed on it and its 'external' factories in the former SBZ were passed to the control of the government of the DDR. The German production of the USSR *Fakultativwagen* therefore drew to a close and it was superseded for new deliveries by USSR-built passenger and freight stock. The large quantity of *Fakultativwagen* which had been supplied however meant that it was widely disseminated across the USSR and remained in use for many years thereafter. Indeed it lingered on as a somewhat non-standard shaped vehicle, either on the track or adjacent to it,





Lost in space and time..... deep in the Carpathian Forests an abandoned car was found in 2010 on a short disconnected length of forestry track.

A. Andrushchenko (<http://po-ua.com>)

along many industrial lines until relatively recently.

But in the end it must be remembered that this officially was not a *Fakultativwagen* it was a 'Комбинированный Товаро-Пассажирский Вагон' (a 'Combined Freight-Passenger Wagon').

#### References:

1. ECE/FAO Staff, Timber prospects in the U.S.S.R., in 'Unasylya' Vol.7 No.2 (06/53), Food And Agriculture Organization of the United Nations, 1953.
2. Downs E.A., Speed Limit 20, The Australian Railway Historical Society, 1963.
3. Gratton R., The Leek & Manifold Valley Light Railway, RCL Publications, 2005.
4. <http://de.wikipedia.org/wiki/Fakultativwagen>
5. [http://germanrail.fr.yuku.com/reply/554#\\_UxH6uON\\_uSo](http://germanrail.fr.yuku.com/reply/554#_UxH6uON_uSo)
6. [http://www.mkb-berlin.de/fz\\_mkb12.htm](http://www.mkb-berlin.de/fz_mkb12.htm)
7. Hormann W. & Machel W.-D., Kleinbahnen im Altkreis Greifswald, Verlag Kenning, 1998.
8. Nauchspies W. & Berg T., Die Demminer Kleinbahnen, Eisenbahn Kurier Verlag, 2004.
9. Richter R., Die Westpreußische Kleinbahnen-Aktiengesellschaft, Eisenbahn Kurier Verlag, 2002.
10. Machel W.-D., Die Fakultativwagen der ehemaligen Mecklenburg-Pommerschen Schmalspurbahn, in 'Die Museums-Eisenbahn 3/1990'.
11. <http://www.kirchegrosskreutz.de/historisches/groß-kreutz/>
12. Machel W.-D., Die Fakultativwagen der ehemaligen Mecklenburg-Pommerschen Schmalspurbahn, in 'Die Museums-Eisenbahn 3/1990'.
13. Machel W.-D., Die Fakultativwagen der ehemaligen Mecklenburg-Pommerschen Schmalspurbahn, in 'Die Museums-Eisenbahn 3/1990'.
14. Machel W.-D., Die Mecklenburg Pommersche Schmalspurbahn, alba, 1984.
15. [http://de.wikipedia.org/wiki/Donnerb%C3%BChse\\_\(Personenwagen\)](http://de.wikipedia.org/wiki/Donnerb%C3%BChse_(Personenwagen))
16. <http://www.donnerbuechse.eu/>
17. [http://de.wikipedia.org/wiki/G%C3%BCterwagen\\_der\\_Deutschen\\_Reichsbahn](http://de.wikipedia.org/wiki/G%C3%BCterwagen_der_Deutschen_Reichsbahn)
18. [http://www.hs-merseburg.de/~nosske/Epochell/fg/e2f\\_gwix.html](http://www.hs-merseburg.de/~nosske/Epochell/fg/e2f_gwix.html)
19. <http://de.wikipedia.org/wiki/Behelfspersonenwagen>
20. [http://de.wikipedia.org/wiki/Baureihe\\_MCI-43](http://de.wikipedia.org/wiki/Baureihe_MCI-43)
21. ECE/FAO Staff, Timber prospects in the U.S.S.R., in 'Unasylya' Vol.7 No.2 (06/53), Food And Agriculture Organization of the United Nations, 1953.
22. Nettl J.P., The Eastern Zone and Soviet Policy in Germany 1945-50, Oxford University Press, 1951.
23. Chester K, Klaus P., & Pochadt H., Two Reparations 0-8-0s for the Soviet Union, in Chester K.R. (Ed), 'Parovozy Vol 3 – Narrow Gauge Steam Locomotives in Russia and the Soviet Union', Trakside, 2003.
24. [http://de.wikipedia.org/wiki/Waggonbau\\_Bautzen](http://de.wikipedia.org/wiki/Waggonbau_Bautzen)
25. [http://en.wikipedia.org/wiki/Waggonbau\\_G%C3%B6rlitz](http://en.wikipedia.org/wiki/Waggonbau_G%C3%B6rlitz)
26. <http://www.msg-ammendorf.de/content.php?t=geschichte&contact&art&l=de&print=on&jid>
27. [http://de.wikipedia.org/wiki/Waggonbau\\_Bautzen](http://de.wikipedia.org/wiki/Waggonbau_Bautzen)
28. [http://de.wikipedia.org/wiki/Gothaer\\_Waggonfabrik](http://de.wikipedia.org/wiki/Gothaer_Waggonfabrik)
29. <http://www.kuehlwaggon.de/geschichte/1945jetzt/index.html>
30. <http://www.zoep.de/weimar-werk/history/history-veb-weimar-werk/>
31. <http://www.ftdctf.de/index.php/de/features/historie>
32. [http://de.wikipedia.org/wiki/Christoph\\_&\\_Unmack](http://de.wikipedia.org/wiki/Christoph_&_Unmack)
33. [http://en.wikipedia.org/wiki/Waggonbau\\_G%C3%B6rlitz](http://en.wikipedia.org/wiki/Waggonbau_G%C3%B6rlitz)
34. Chester K, Klaus P., & Pochadt H., Two Reparations 0-8-0s for the Soviet Union, in Chester K.R. (Ed), 'Parovozy Vol 3 – Narrow Gauge Steam Locomotives in Russia and the Soviet Union', Trakside, 2003.
35. [http://en.wikipedia.org/wiki/LEW\\_Hennigsdorf](http://en.wikipedia.org/wiki/LEW_Hennigsdorf)
36. [http://de.wikipedia.org/wiki/Waggonbau\\_Bautzen](http://de.wikipedia.org/wiki/Waggonbau_Bautzen)
37. [http://de.wikipedia.org/wiki/Gothaer\\_Waggonfabrik](http://de.wikipedia.org/wiki/Gothaer_Waggonfabrik)
38. <http://www.kuehlwaggon.de/geschichte/1945jetzt/index.html>
39. <http://www.msg-ammendorf.de/content.php?t=geschichte&contact&art&l=de&print=on&jid>
40. <http://www.zoep.de/weimar-werk/history/history-veb-maehdrescherwerk/>
41. <http://www.zoep.de/weimar-werk/history/history-veb-maehdrescherwerk/>
42. Kühle M., Machel W.-D., Schmalspurwagen der Waggonfabriken Ammendorf und Weimar ab 1946/47, in 'Die Museums-Eisenbahn 1/1997'.
43. [http://de.wikipedia.org/wiki/G%C3%BCterwagen\\_der\\_Verbandsbauart](http://de.wikipedia.org/wiki/G%C3%BCterwagen_der_Verbandsbauart)
44. [http://www.hs-merseburg.de/~nosske/Epochell/fg/e2f\\_gwix.html](http://www.hs-merseburg.de/~nosske/Epochell/fg/e2f_gwix.html)
45. <http://en.wikipedia.org/wiki/Austauschbauart>
46. [http://www.hs-merseburg.de/~nosske/Epochell/fg/e2f\\_gwix.html](http://www.hs-merseburg.de/~nosske/Epochell/fg/e2f_gwix.html)
47. [http://de.wikipedia.org/wiki/Donnerb%C3%BChse\\_\(Personenwagen\)](http://de.wikipedia.org/wiki/Donnerb%C3%BChse_(Personenwagen))
48. <http://www.donnerbuechse.eu/>
49. [http://de.wikipedia.org/wiki/G%C3%BCterwagen\\_der\\_Kriegsbauart](http://de.wikipedia.org/wiki/G%C3%BCterwagen_der_Kriegsbauart)
50. [http://www.hs-merseburg.de/~nosske/Epochell/fg/e2f\\_gwix.html](http://www.hs-merseburg.de/~nosske/Epochell/fg/e2f_gwix.html)
51. Deutsches Reichsbahn Gesellschaft, Güterwagenbuch 1882-1945 (1992 English Edition), AlteZeitGruppe, 1992.
52. [http://www.hs-merseburg.de/~nosske/Epochell/fg/e2f\\_gwfb.html](http://www.hs-merseburg.de/~nosske/Epochell/fg/e2f_gwfb.html)
53. Deutsches Reichsbahn Gesellschaft, Güterwagenbuch 1882-1945 (1992 English Edition), AlteZeitGruppe, 1992.
54. Kühle M., Machel W.-D., Schmalspurwagen der Waggonfabriken Ammendorf und Weimar ab 1946/47, in 'Die Museums-Eisenbahn 1/1997'.

#### Acknowledgements:

I must particularly thank Sergei Dorozhkov for his help, guidance and useful references during the preparation of this paper.

Thanks must also go to the Transport Research Institute at Edinburgh Napier University for allowing me to use their academic research facilities.

In addition I must also thank all the photographers for their willingness to allow the use of their pictures and to acknowledge the amazing help offered by two Russian websites:

- <http://narrow.parovoz.com/indexe.php>; and
- <http://scaletrainsclub.com/board/viewforum.php?f=52>.