



# Trainsimming Modern German Railways

Part Three Feb 2003



A BR 365 shunter pulling  
Fcs gravel self-loader. In  
the background are  
Habbins Sliding wall  
wagons belonging to  
Transwaggon

BR 365 model Volker M.  
Bollig

Welcome to Part Three Trainsimming Modern German railways

## *In Part Three:*

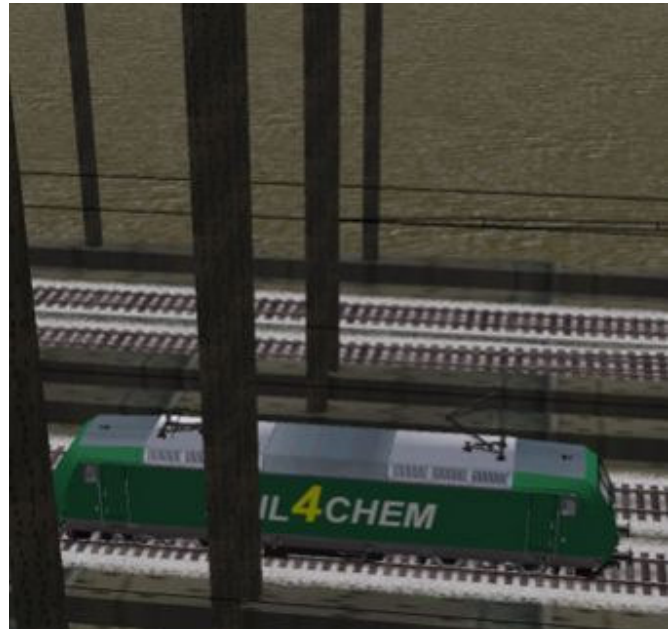
- **Freight since 1989**
- **Diesel color schemes**
- **Diesel locomotives in Use**
- **Freight wagon classification system**
- **Freight Wagons**
- **Resources**

In my mind I link Diesel locomotives and freight - the two areas we are covering in Part Three - although that is of course not true; there are many areas, particular in North and East Germany with diesel hauled passenger services, and even some going down the Rhine valley, originating outside the electrified areas.

Conversely, the majority of Freight is of course electrically hauled.

The 1990's has seen a dramatic change in German rail freight, with a collapse in traffic and the closure of many marshalling yards and retirement of typical freight cars and many shunters, to rebuilding of freight with specialized wagons, new locomotives, and investments in container depots, the merger of the DB and Dutch freight operations, while at the same time seeing the introduction of open access freight operators on German railways.

A Rail4Chem BR 145. This is just an excuse to show off the new water textures from Oneal Smyrl, Joseph Realmuto's Fine Track and Scott Miller's TrackAce, as Freight trains do not cross the Hohenzollen bridge. Model MadMike repaint Ingo Wittenberg



## The changing Freight scene since 1989.

The changing face of freight in Germany since 1989 has in many ways been more dramatic than for passenger traffic.

In summary this has been:

- The dramatic fall in rail hauled freight, particularly in East Germany.
- This in turn led to the closure of many marshalling yards, the retirement of many diesel shunters, and open and closed freight wagons. In 1989 DB and DR combined had around 374,000 freight wagons, by 1995 the new DB AG had only 191,000 wagons. By 2001 DB cargo had 128,059 Wagons, 3,564 locos and ran an average of 6,318 trains a day.
- The provision of open access has meant the entry into the market for open access operators, for example Rail4chem, specializing in the transport of chemicals. (Freight traffic in ports and large industrial areas, has always been the responsibility of privately owned companies.)

Following privatization DB AG set up a separate freight company DB cargo, then proceeded to merge with the now separated freight activities of the Dutch railway NS (Nederlandse Spoorwegen) and later the freight activities of the Danish railways DSB Gods. This was renamed Railion, and some electric engines carry this name, but its use has been discrete within Germany. As we saw in part One DB cargo has invested heavily in new electric locos, including multi-current for use in neighboring countries.

To meet the demands of customers DB cargo has invested heavily in new specialized Freight wagons, particularly those with opening sidewalls, and in self-loading hopper wagons, particularly for coal. Private companies have also invested in freight wagons, particularly double bogies and longer two axle sliding wall wagons, and in car transporters for new cars.

DB have also invested upgrading the left Rhine bank for traffic coming out of the Netherlands, and is adding an extra line and a flying interchange at Oberhausen for traffic coming from the new Betuwe line Rotterdam to Germany freight line that we identified in Part One.

New facilities include the container terminal at Eifeltor near Köln, and in upgrading and concentrating the marshalling yards to just eight: Hagen; Köln-Gremberg, Halle (Saale), Maschen (Hamburg) Seelze (Hannover), Mannheim; Nürnberg and München Nord. Only one of these Halle is in former East Germany.

## Diesel locomotives

As a reminder from Part One, Diesel locomotives from 1968 Diesel locomotives have a class series starting with a 2 and shunters (switchers) a class starting with a 3. Deutsche Reichsbahn used 1 for both classes. These were renumbered into the 2 and 3 series following reunification.

Prior to 1968 a V for Verbrennung (Combustion) was used for diesels.

### The DB Type program.

In the 1950's the Federal Railways Office (Bundesbahn-Zentralamt) in Munich, decided to build a series of diesels to replace steam on non-electrified railways, particularly on the North German plain, and for use as shunters, as it was decided not to use Electric shunters. The BZA identified the following needs:

- V-60** a medium sized shunter
- V-100** A more powerful locomotive for use on branch lines
- V-200** A powerful diesel for pulling trains on relatively easy mainline routes (particularly in North Germany)
- V-300** A power diesel for pulling heavy trains.

All of these are diesel hydraulic trains, based on the success of the **V 80** series (of which 10 were built).

In the mid 60's they identified the need for a heavier shunter, and the long nosed **V 90** was developed.

The **V 160** was developed for medium weight trains from 1956.

The **V 200** and the more powerful V 200.1 are beautiful machines. 2003 is the 50th year of their introduction, but also the 15<sup>th</sup> year of their retirement. In the event although two prototypes of different heavy diesels were built - the **V 300** and the **V 320** – DB lost interest and none were built. The V 320 is a beautiful looking machine, and helped in the development of the V 160 series – and after being used in Italy for construction trains is now back in Germany in a similar role for Wiebe.

In addition DB has small shunters (Köf), but in steeply declining numbers.

In contrast to Electric locomotives it is only now (December 2002) that DB Cargo has put out a tender for a new type of diesel, capable of 140 km/h, with an initial order of 200 and an option on the further 370, although DMU's have and are replacing diesel pulled push-pull trains.

The twin-diesel V-200: 2003 is the fifteenth year of the prototype. It has been retired 15 years. There were 86 of the V200 (including prototypes) and 50 of the more powerful V200.1 Model Thomas Pilder





The V 320 – only one prototype was built of the Co-Co diesel. It is now used for route construction trains by Wiebe; Model Manfred Laugwitz



## Deutsche Reichsbahn

DR also developed a similar range of diesels, for which they also classes as V 60, V 100, as well as V 118 (no longer in use) for medium sized trains.

In contrast to the DB they did have a V 300 heavy diesel, for which they bought the diesel-electric ‘Ludmilla’ from the Soviet Union. The Ludmilla is still in extensive use throughout Germany, as the backbone of heavy freight on non-electrified lines and cross border traffic.

DR also had a medium diesel the BR 119, from Rumania, known as the U Boat, because of its cramped conditions, which survived in programmed service until December 2002 because of its electrical heating ability.

All Diesel locomotives in currant use are variations or rebuilds of the basic types, with more powerful motors, radio control and automatic coupling on shunters and controls for push-pull trains and electric heating

replacing steam heating for the passEngfer train pulling diesels

### Color schemes

From 1950 Diesels were painted **magenta red (Pupporrot)**. From 1969 the 216 type were painted in **beige** with the **Ocean Blue** skirt, similar to the Electric locomotives. The **V 90** and other **shunters** were painted in a reverse scheme of **Ocean blue with a beige skirt**.

Subsequently diesels have followed the oriental red scheme from 1985 – 1994, and then traffic red. Some are still in their original colors.

Some **BR 216** were painted **orange and gray** for the Citybahn service from Köln, and one 218 is in the **multicolored Touristik** color scheme. One was painted in the **TEE** colors.

**DR shunters** were painted **orange**, although it actually looks more yellow; the larger diesels in **Bordeaux red**

Open access has meant far more variety on the Railways. This is a General Motors Class 66 leased by HGK (Hafen und Guterverkehr Köln). Class 66 are also used by Rail4Chem and DLC. Model Matthew Peddesden. Texture Chris Stewart



## The DR V 100 series

BR:	202	203	204	298
Old BR:				
DR	112	-	114	111
Number Built:	500R	8R	65 R	80
	1970s-80's	1999-2001	1983-1990	1978 - 1993
Max Speed	100 Km/h	100 Km/h	100 Km/h	65 Km/h
In Use	8	8	37	80



A BR 202 Model: Rene Fischer, Manfred Laugwitz und Felix Banaszak

Color: DR Orange (298); Bordeaux Red Oriental Red; Traffic Red. The 203's have multicolor designs. The last orange 298 was repainted in 2001.

Use: The V-100 or DR 110 is a diesel Hydraulic, designed for mixed traffics by DR and used for light fright and shunting. DR built 868 between 1967 and 1978.

DR converted about 500 in the 1970's and 80's with a more powerful engine – this is known as the Class 112, which became the DB Class 202. About 60 had a more powerful engine and are know as DR class 114

Conversely 37 of the locomotives were re-gearred for heavy shunting, and the steam heating boiler removed and replace with heavy ballast. After further rebuilding by DB they became the class 298.3, who converted 43 further 201's.


The V-100 is not suited to heavier workings, and those in passenger duties the 202 owned by DB Regio have been replaced by DMU's. Some 202's are in a hire pool for hire by private operators, and have been updated, and know as 203's. The 204 and 298 belong to DB Cargo.

They are found exclusively in the former East Germany.



A BR 298 still in the original DR orange color. The last one was repainted in 2001. Model Alpha und Djgramusel Repaint Ingo Wittenberg

## DB V100 Series

BR:	211	212	213	
Old BR:	V 100	V100.20		
Built:	1961-1966	1962-1966	1966	
Number Built:		371	10	
Max Speed	100 km/h	100 km/h	100 km/h	
In Use	0	50 +15 BR 714	3	
Color: Magenta, Ocean blue; Oriental and Traffic red. Three of the 714 are in Fire red.				
Use: The V 100 (BR 211) was designed for mixed branch work, and is equipped with steam heating. The V 100.20 (BR 212) was a more powerful version, and the BR 213 has dynamic brakes. The 714 is a rebuilt version equipped as a Tunnel rescue train.				
None of the 211 remains in service, and the others are quickly disappearing, apart from the BR 714 Tunnel rescue engines.				
Model: MadMike				

## The V 160 series

### V 160 BR 216

In 1956 DB wanted to replace its steam engines used for pulling medium weight trains. Following the success of the V-200, coupled with the rising price of coal they decided to go for a diesel with hydraulic drive and with steam heating capacity. The number V 160 was chosen as double V 80) a successful locomotive. The first prototypes in 1960 had a rounded front, but Henschel, who had developed the V-320 (double 160) as a private initiative used the front for the tenth prototype in 1963, and from then on the V-160 had its distinctive front. 214 were delivered between 1964 and 1968. The V 160 is 16m long, but all other variants are 16.4m long.

As they had no electrical heating the engines were pulled from long distance duties to pull shorter Regional trains, and then cargo. By Summer 2001 there were only 16 left in the Rhine and Ruhr area

### V 162 BR 217 and V 164 BR 218

By the mid sixties DB decided that instead of a very powerful locomotive, they could use a more powerful the 160 in multiple traction, but one with electric heating, rather than steam heating. After prototypes with the electric heating produced by

an additional generator, or straight from the main diesel they decided on both with 12 (series) 217's and 12 218's built. In the event although an extra generator is useful to heat a standing train, having the generator on the main engine was more economical and in total 415 BR 218 were built from 1971 to 1979.

### BR 215

DB used the experience gained in the 217 and 218 with more powerful 215, of which 140 were built between 1969 and 1971; they are all equipped for push-pull and multi-traction duties. However, as the electrical heating was not considered ready they were built with steam heating, although there is place left for the electrical equipment. At the beginning of the seventies they were used on long-distance train duties in the North and west parts of Germany, but the lack of electrical heating has meant they were downgraded to Regional trains and cargo trains. DB Regio now owns all BR 215.

### BR 225

54 BR 215 had their steam heating removed in 2001 and are known as BR 225. They are owned by DB cargo, and just used for freight.

[www.dbtrains.de](http://www.dbtrains.de) has some good pages in English on the V-160



BR:	215	225	217
Built:	1968 -1971	2001	1965 -1968
Number Built:	140	54 R	15
Max Speed	140 Km/h	130 Km/h	13*
In Use	44	54	



Color: Ocean Blue/beige, Oriental red, Traffic red

Use: Now mainly freight. The 215/225 in West Germany and the 217 in North Bavaria

\*+ 2 at the FTZ Munich as BR 753

Model Michael Davies Repaint Diego de Jonge

BR:	216		
Old BR:	V 160		
Built:	1964 -1968		
Number Built:	214 + 10 prototype		
Max Speed	120 Km/h		
In Use	43		



Color: Ocean Blue/Beige, Oriental Red, Traffic red (only a few)

Use: Now Cargo

Model Michael Davies Repaint Rainer Bluhm

BR:	218		
Old BR:			
Built:	1968 -1979		
Number Built:	415		
Max Speed	140 Km/h		
In Use	410		



Color: Ocean Blue/Beige, Oriental red and Traffic red. One in the Multi Touristik color and one are in the TEE color, one in Royal Blue advertising livery.

Use: Passenger trains in all non-electrified lines, including former East Germany where they are replacing the 219.

Model Michael Davies Repaint Rainer Bluhm

## BR 219 The U Boat

BR:	219	229	
Old BR:	119		
Built:	1977-1985	1992	
Number Built:	200	20	
Max Speed	120 km/h	140 Km/h	
In Use	72	2	



Color: Bright Red/Beige Orient Red, Traffic Red

Use: Passenger and freight in Former East Germany

The “U-Boat”, so called because of its confined cab was built for DR in the Rumanian “23 August” engine works. They have continued in use because of their electrical heating capacity until this year in former East Germany, but are no longer timetabled from Dec 2002.

The 229 is a rebuilt machine for IC and IR post reunification before the lines were electrified, but for some reason were not used for this for long before used for Regional trains.

There is a good site with pictures of the BR 219 at <http://www.baureihe219.de/englisch/br219.htm>

Model UnrealTom Repaint Ingo Wittenburg

## Ludmilla

BR:	232	234	241	241.8
Old DR:	132			
Built:	1973-82	1991-97	1991-2001	
Number Built:	709	64	5	5
Max Speed	120	140	100	100
In Use	431	31		



Color: DR Bordeaux Red, Orient red, Traffic red: One 234 in Turquoise.

Use: 232 Freight 234 Passenger trains (including push pull) 241 heavy freight


The “Ludmilla” was built in the USSR for DR, and is diesel electric – most DB diesels are Diesel hydraulic. Post reunification continues to have a successful career throughout Germany, including cross border traffic into Belgium. The 232 are owned by DB cargo and based in former East Germany and the Ruhr. 31 had their engines replaced by a variety of Manufacturers, or from the retired BR 230 in particular caterpillar, for 140Km/h pulling IR passEngfer trains. These are now used around Dresden for Regional push pull trains.

The 241 and 241.8 have had their engines replaced with more powerful engines, but lower speeds and are used for heavy traffic between the Ruhr and the Netherlands and Belgium respectively.

Models: Left Protrain2, Right German Railways (Freeware)



## The DB V-90 Series

BR:	290	291	294.9	295	
Old BR:	V 60				
Built:	1964	1974	1995		
	-	-	-		
	1974	1977	2000		
Number Built:	408	103	305R	70 R	
Max Speed	80	90	80	90	
In Use	111	30	297	73	


Color: ocean blue/Beige (290/294 five remaining in 2001); Oriental Red; Traffic red

Use: The V 90 was developed to meet the need for a heavy Shunting engine. It used many of the design of the V –100, but with the more powerful engine of the V100.20, and no steam heating.

From 1998 –2000 250 BR 290’s were equipped with radio control and automatic coupling and were reclassified as 294. 10 of these 294 901 to 910 can be controlled by satellite. 73 291’s were equipped with radio control, and classed as BR 295

The 290/294 is found throughout Germany, including East Germany: the 291 /295 in North Germany and Rostok.  
*There are still some BR 290 in the Ocean Blue Beige color scheme. Model Felix Banaszak*

## Köf 10 -12

BR:	332	333	335	
Old BR:	Köf 10 - 11	Köf 12	Köf 12	
Built:	1959-66	1965 - 1978	1987-1994	
Number Built:	317	251		
Max Speed	45 Km/h	45Km/h		
In Use	3	39	150	

Color: Magenta, Ocean Blue/ Beige, Oriental Red ,Traffic Red

Use: Shunting including some in former East Germany.


A fast disappearing breed are the small shunting engines, know as Köf, which stands for Small Diesel locomotive with Hydraulic drive. (Kleinlokomotive mit Dieselmotor und hydraul. Leistungsübertragung).

The 332 have a chain drive and the 333 have a drive shaft. The 335 is a 333 rebuilt with radio control and half automatic coupling.


The Ex DR equivalentents the Kö (BR310- 312) and the larger V-23 are no longer in service with DB.

Model Uwe Franke Repaint Ingo Wittenberg

## DR V60

BR:	344-347	
Old BR:	V60	
Built:	1960-75	
Number Built:	1100	
Max Speed	60Km/h	
In Use	83	
Color: DR Orange (4 in 2001); Oriental Red; Traffic Red		
Use: Shunting in Former East Germany.		
<p>Over 1100 V 60's were built as the standard shunter for DR. They have 4 coupled axels compared the DB V-60 three. Renumbered as 106, as there were not enough numbers in the series so the later ones were classed BR 105 –later BR 346 and 345. 6 were rebuilt for metre gauge as BR 347. 79 locos were rebuilt with a les powerful engine and are known as BR 344.</p>		
<p>They have been taken out of service because of reduced freight traffic or replaced by the BD v-60.</p>		
<p><i>There are still some ex DR V60sin their original colors including those used by private operators</i></p>		
<p><i>Model: Mirko Küster (BR 143 Protrain 2).</i></p>		

## DB V60 Series

BR:	360 - 365	
Old BR:	V 60	
Built:	1956 -1964	
Number Built:	942	
Max Speed	60 km/h	
In Use	333	
Color: Magenta (Pupporet) ocean blue (20 in 2001), oriental red and traffic red.		
Use: The DB V-60 was part of the original Type program, and distinguishes itself from the DR V-60 by having only 3-coupled axels.		
<p>Use for shunting and light duties on Branch lines. The 361 had heavier ballast, and, the majority have been rebuilt with radio control.</p>		
<p>Found through Germany, including Former East Germany</p>		
<p>Model: Volker M. Bollig</p>		

## BR 399

BR 399 are 1000m gauge shunting engines used on the island of Wangerooge. There are 4 of them.

## UIC Coding structure for freight wagons.

E	Standard open goods wagons (standard gondolas)
F	Special open goods wagons (special gondolas)
G	Standard closed goods wagons (standard box cars)
H	Special closed goods wagons (special box cars, mainly sliding walls)
I	Refrigerator wagons (reefers)
K	2-axle standard flat cars
L	Special flat cars
O	Standard flat and utility cars
R	Standard flat cars with bogies
S	Special flat cars with bogies
T	Wagons with opening roof
U	Other special wagons
Z	Tank wagons

Since 1980 Deutsche Bahn has used the UIC coding structure to describe a freight car. This consists of an initial type letter e.g. H, followed by a series of small letters describing the wagons characteristic, plus a build series number, normally shown in superscript.

E.g. Es<sup>027</sup>

Some of the small letters apply to all wagons, and types, and others are specific to a particular wagon type only. Of the latter the most relevant are 'a' bogie; 's' can travel up to 100 Km/h and 'ss' can travel up to 120Km/h

In this example the s applies to all wagon types and means it is designed to travel up to 100 km/h. E means it is a standard open goods wagon

21 RIV - To show it can be used for International Traffic (Regolamento Internazionale Veicoli) 21 means 2-3 axles Railway owned

80 DB - The code number and owner of the wagon

524 7 068 -0 The number of the wagon and the check digit

ES 027 The Type of Wagon and the build series.

The symbols give the length over the buffers, the dead weight of the wagon (in the rectangle), length of the loading area, and the floor space of the loading area (in the lozenge).

The ABC table gives the permitted axel load for that particular classification of track. The \*\* means it can travel at 120Km/h





A two axel Es027 built in the USSR for DR in 1991. Equipped with Knor KE-GP airbrakes. 1848 of the 2030 are in service.

The 4 axel is (probably) an Eanos- X 055 with a top speed of 120mph, of which DB rented 896 from the by DB from the Ahaus-Alstatter Eisenbahn from 1997. The -x means it has a steel rather than wooden floor.

Models Andreas Engfer



### E Open Wagons

E wagons are traditional open wagons with sides used for the transport of almost all weather-insensitive goods, including coke, coal, ore, scrap iron, sand and crushed stone to wooden logs and waste wood. From 1987-on only 4 axel bogie open wagons have been built. There are some 4000 two axel wagons and 12,300 four-axel wagons, the last series being built from 1997.

### F Self Loading Cars

Fals wagons are often seen being pulled by double traction locos, for example carrying brown coal from Poland to the Ruhr, or imported coal from the Netherlands, down the right bank of the Rhine and across it al Koblenz to go to Trier (Luxembourg) This roundabout route avoids gradients. The White circle means it is equipped with 4000t automatic coupling. Model of Falns 180 MadMike

Almost all F cars are self-loading hoppers, that have replaced the traditional open type, with specialized types for specific customers, but there are some side tipping wagons, with hydraulic ramps.



Fans128. The entire wagon tips up on hydraulic ramps. Model Didi2004



## G The (Traditional) Covered car

Two Gbs. These are actually SBB (Swiss) versions: Model: Andreas Engfer. The Shunter is a BR 312



The G type is in decline in Germany, as elsewhere, replaced the Sliding wall H wagons.

There are very few with standard size axels base (Gs and Gls about 5.7m), and these in service are in almost exclusively ex DR wagons with 8m-axel width (Gbs) of which there are some 2,200 left. The b means it has a loading area with a length of 18m or longer.

## H Special Build Covered cars

Originally H class referred to cars with opening end walls, but now are exclusively sliding wall wagons, of which the DB has some 13,000, with significant buildup in the last decade to meet customers needs.

The Sliding Wall wagons come in various versions with both 2 and 4 axels, owned (or leased by) both DB and private owners, although DB has only 100 double axel versions, the remainder in private ownership.

A BR 202  
pulling  
Hbbills  
Sliding-wall  
wagons.  
Wagon  
repaints  
Andreas  
Engfer.



A Habbis  
sliding wall  
wagon  
owned/leased  
by Opel.  
Repaint  
Andreas  
Engfer



## I Refrigerated wagons

Referred to as Refrigerated vehicle – it is more exact to say: Car with thermal isolation .

Most are in private ownership.



Model  
UnrealTom



## K - Two axel flat wagon with small sides to hold the loads.

Those with stakes or stanchions are known as Rungenwagen. There are about 8,000.

## L Special built flatwagons wagon with bogies

These are essentially:

- Car transporters (for new cars)
- 2 Axel container wagons, some of which have been rebuilt from other types.

An Lgs two axel container wagon Model Mats Strid Repaint Roland



ATG (part owned by DB) uses these Laekks car transporters to carry cars from the Belgium VW factory to Germany.



The sets work in pairs

Model MS Trainstop team



A Ks Rungenwagen Model MS trainstop

## R Standard Flat wagons with bogies

These are standard flat wagons, although some types (Rins) have PVC hoods.

There are some specialized wood carrying wagon, with High front and rear ends  
They are for the transport of heavy and long products of the iron and steel industry (bar, rails, machines, rolled sections) and prefabricated elements, wood etc.

Car with side boards used for semi-finished material, wire roles, sand and stones.

Rins Model  
Andreas  
Engfer



Rs  
Model  
MadMike



Res – with  
sides

Model  
Andreas  
Engfer



## S Special Build Flat wagons with Bogies

The S series probably has more variety in it than any other type:

**Sgs** - Container wagons (intermodal work) – there has been considerable investment by DB in this area.

**Sahmms**: Flat wagons with floors designed for the transport of rolled steel

**Shimmns**: also for the transport of rolled steel but covered – there are two types both with the designation Shimms – one has a three part steel hood which rolls back, and the other a PVC hood.

Sgs Container  
Wagon Svante  
Wendel  
Re-skin:  
Diego 'Sauna'  
de Jonge



Two types of Shimms, Shimmns with a sliding metal cover, and the Shimmns-tu with a PVC cover.

Shimmns Robert Österman Repaint: Diego 'Sauna' de Jonge

Shimmns-tu s DB cargo: Model MS Trainstop Repaint Diego de Jonge

### T Closed wagons with opening roofs

These are wagons with an opening top, and are for example a variants on sliding-wall wagons, on self-loading hopper wagon, or a more specialized wagons such as below.



Taems829  
Model  
Didi2004



## U Other categories

The U series are occupied by wagons that do not fit into other categories. Most are built in small numbers, and the largest grouping is flat wagons for heavy loads 'tiefladewagen', and the second grouping tankers, most of which are privately owned.



Model MadMike

Uahs  
Wagon  
Robert  
Österman  
Repaint:  
Diego  
'Sauna' de  
Jonge



## Z Tankers

These are all privately owned gas wagons.

Zagkks Gas  
Tankers.

Robert  
Österman  
Repaint:  
Diego  
'Sauna' de  
Jonge



## Resources

The two major Rail magazines (in German) are Eisenbahn Journal and Eisenbahn Kurrier, each of which has an extensive website showing details of their specialist and videos.

[www.merker-verlag.de](http://www.merker-verlag.de) (for Eisenbahn Journal)

[www.eisenbahn-kurier.de](http://www.eisenbahn-kurier.de)

The majority of specialist books can be obtained from the German Amazon site, [www.amazon.de](http://www.amazon.de).

I used *DB - Fahrzeuge Band 1 and 3 (Lokomotive und Triebwagen der DB and Güterwagen der Deutschen Bahn)* as base references.

There are a large number of fan sites. I recommend [www.db-loks.de](http://www.db-loks.de) as it has a brief description and details of the locos plus pictures including cabviews.

The European railservers at <http://mercurio.iet.unipi.it> has excellent pictures with English descriptions.

You can translate sites into English if you load the Google Toolbar – this adds an option to the mouse right click to translate a web site. Otherwise do a search on Google for sites. The map came from [www.bueker.net](http://www.bueker.net)

## Train-sim

There are an increasing number of German trainsim sites. Most in this issue came from [www.thetrain.de](http://www.thetrain.de). The three I use most often are:

[www.thetrain.de](http://www.thetrain.de) (with English): My favorite site and the one I check regularly.

[www.tssf.de](http://www.tssf.de) Sebastian Frey's site  
[www.trainsimworld.de](http://www.trainsimworld.de) Good site for Blackman's cabviews (Superb!)

A new portal with details by classification is [www.koroka.de](http://www.koroka.de)

You can get the Commercial add-ons from the German Amazon site [www.amazon.de](http://www.amazon.de)

You can change consists in activities; the composition of consists and loose consists easily with the freeware Route Riter [www.train-sim.com](http://www.train-sim.com)

Also in the series from [www.train-sim.com](http://www.train-sim.com) or [www.thetrain.de](http://www.thetrain.de)

Trainsimming Modern French railways (3 Parts)

Trainsimming Modern Swiss railways

The Photos were taken with Irfanview (Freeware). This has the advantage that it freezes MSTs to show you the picture in its browser (if you want, or you can set it to take pictures automatically).

Pictures were cropped in Adobe Photoshop Elements and automatically corrected