

Legends on rails

With the BR24 through eras II and III of railway history



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User Manual

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"Railway History"

Short explanation of the eras in railway history, which are partly reflected in the different scenarios and liveries of the locomotives and coaches.

Era I: Early railway companies (until approx. 1925)

Era II: State railways (approx. 1925 to 1945)

Era III: Post-war period (1945 to 1968)

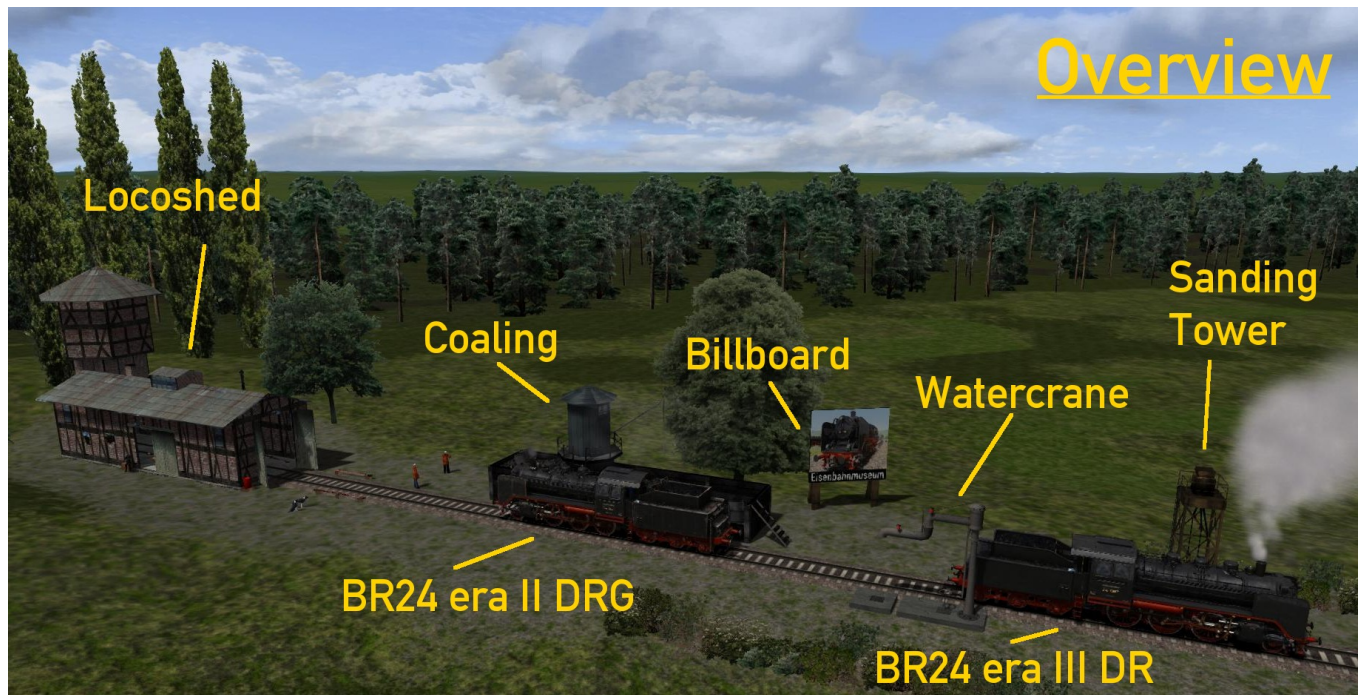
**Era IV: Computerised numbering of the vehicles.
(1968/1970 to approx. 1990)**

Era V: Innovations and union of DB and DR (approx. 1990 to approx. 2006)

**Era VI: New UIC numberings (locomotives have 12-digit numbers)
(starting from approx. 2006)**

The variants of the BR24 class locomotives in this Add-On are numbered for Eras II and III.

Overview of the items in this *Romantic Railroads* Add-On.



BR24

The BR24, nicknamed the 'prairie horse' (Steppenpferd), was developed specially for the long, flat routes in West and East Prussia. 95 examples were built by the firms of Schichau, Linke-Hofmann and other loco builders.

The two units with operating numbers 24 069 and 24 070 were supplied by Borsig with a medium pressure boiler. These locos ran with a boiler overpressure of 245.1 N/cm² (355.5 psi), but were rebuilt in 1952.

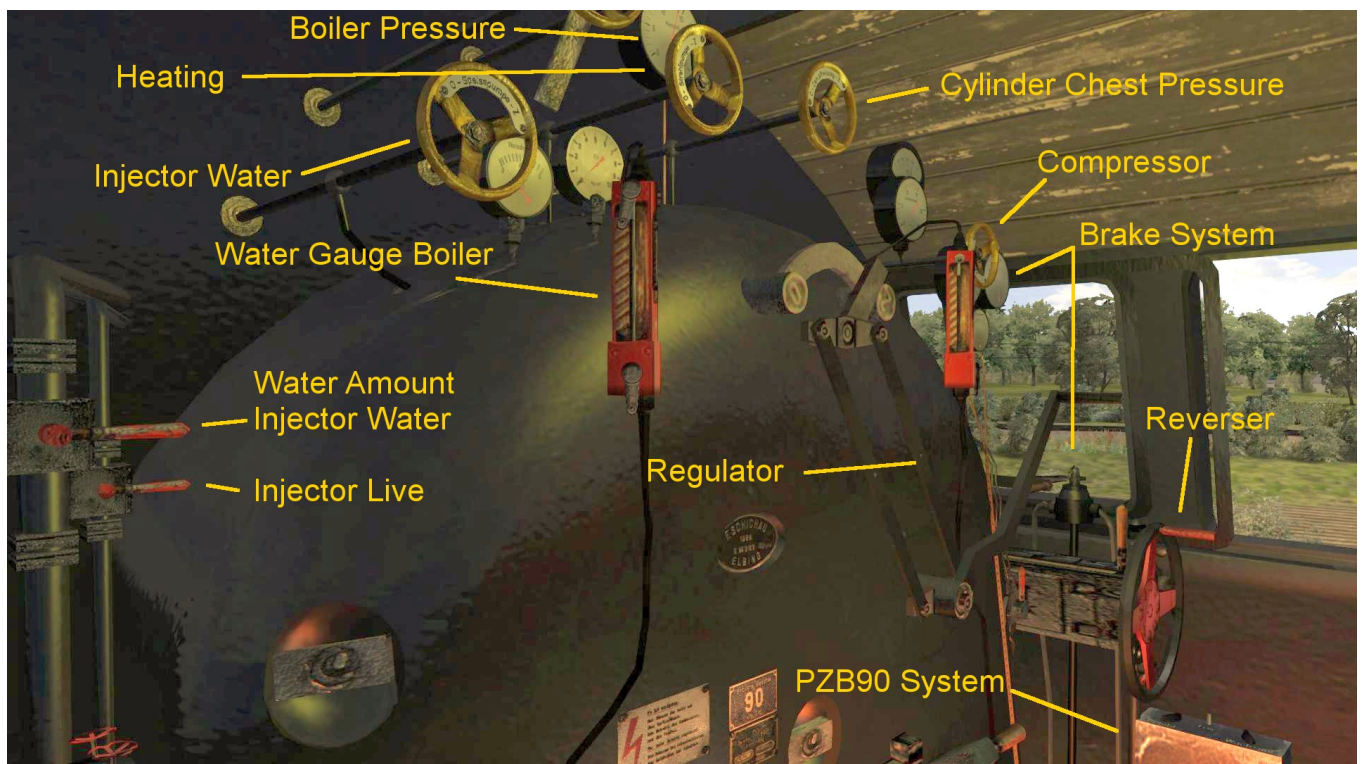
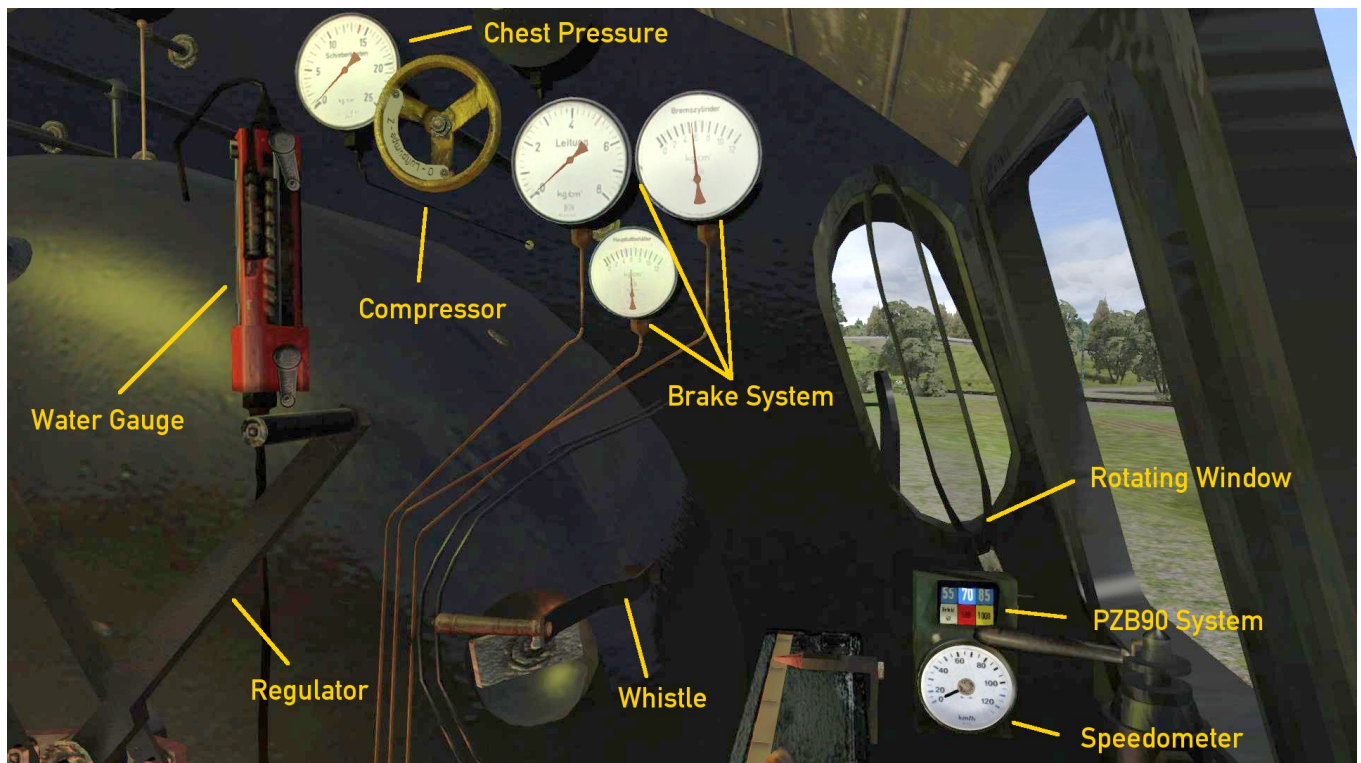
The Deutsche Bundesbahn took over 38 locomotives and retired them by 1966. The last one with the DB was locomotive number 24 067, which was stabled in Rheydt and taken out of service there in August 1966. The engines were given operating numbers 24 001 to 24 095. Engine numbers 24 002, 004, 009, 021 and 030 were left with the DR after the Second World War. They were all stabled in Jerichow shed in 1960 and their sphere of operations until 1968 was the branch line network of the Kleinbahn AG in Genthin. No. 24 009 was re-numbered in 1970 to 37 1009 and was used as a reserve breakdown engine in Güsten and Stendal. In 1972, it was sold to the Federal Republic of Germany.

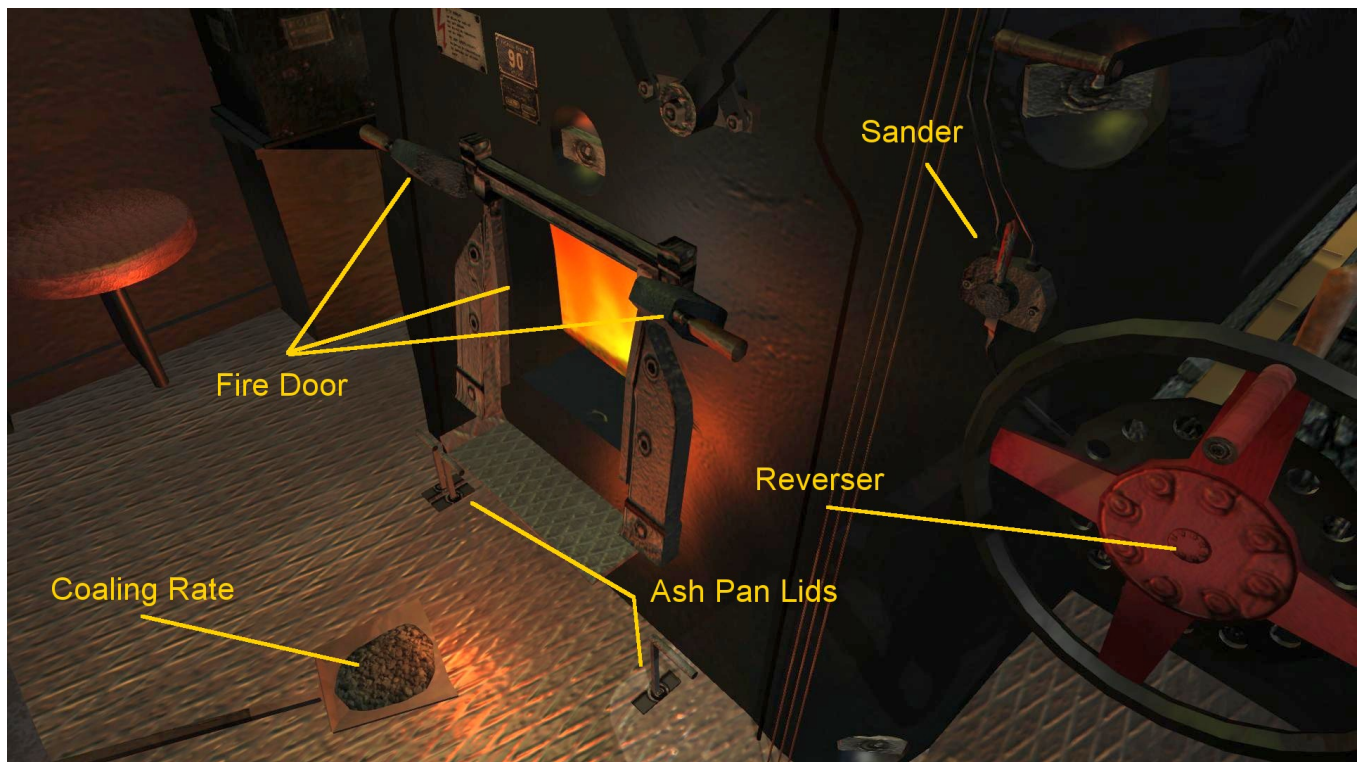
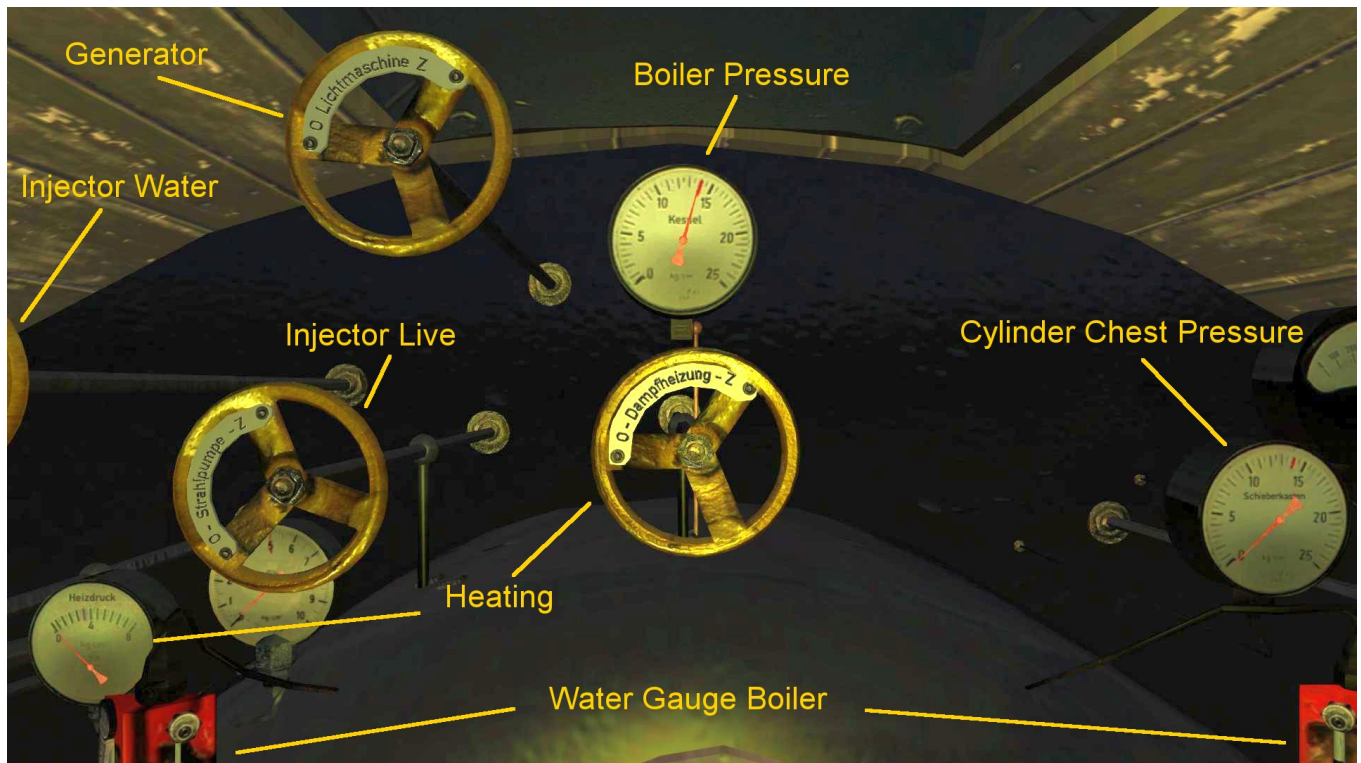
Thirty four locomotives remained in Poland after the Second World War, where the last one was in service until 1976. Even the remaining locomotive in Germany, no. 24 083, had been in service in Poland. The locomotives were equipped with 3 T 16 and 3 T 17 tenders. Four Class 24 locomotives have been preserved - three in Germany (24 004, 24 009 and 24 083) and one in Poland.

Technical Data for BR24 (Source Wikipedia a.o.):

Number(s):	DR 24 001– 095 PKP Oi2 DR 37.1
Quantity:	95
Wheel arrangement:	2 6 0
Year(s) of manufacture:	1928–1940
Gauge:	1,435 mm (4 ft 8 1/2 in)
Length over buffers:	16.955 mm (55 ft 8 in)
Service weight:	57.4 tonnes
Axle load:	15.2 tonnes
Top speed:	90 kph (56 mph)
Indicated Power:	676 kW
Driving wheel diameter:	1,500 mm
Leading wheel diameter:	850 mm
No. of cylinders:	Two
Cylinder bore:	500 mm
Piston stroke:	660 mm
Boiler Overpressure:	14.0 bar
Grate area:	2.04 m ²
Superheater area:	37.4 m ²
Evaporative heating area:	104,48 m ²
Tender:	3 T 16 / 3 T 17
Water capacity:	16 m ³
Fuel:	6.0 t hard coal

The cab controls and gauges are shown here in the cab views:



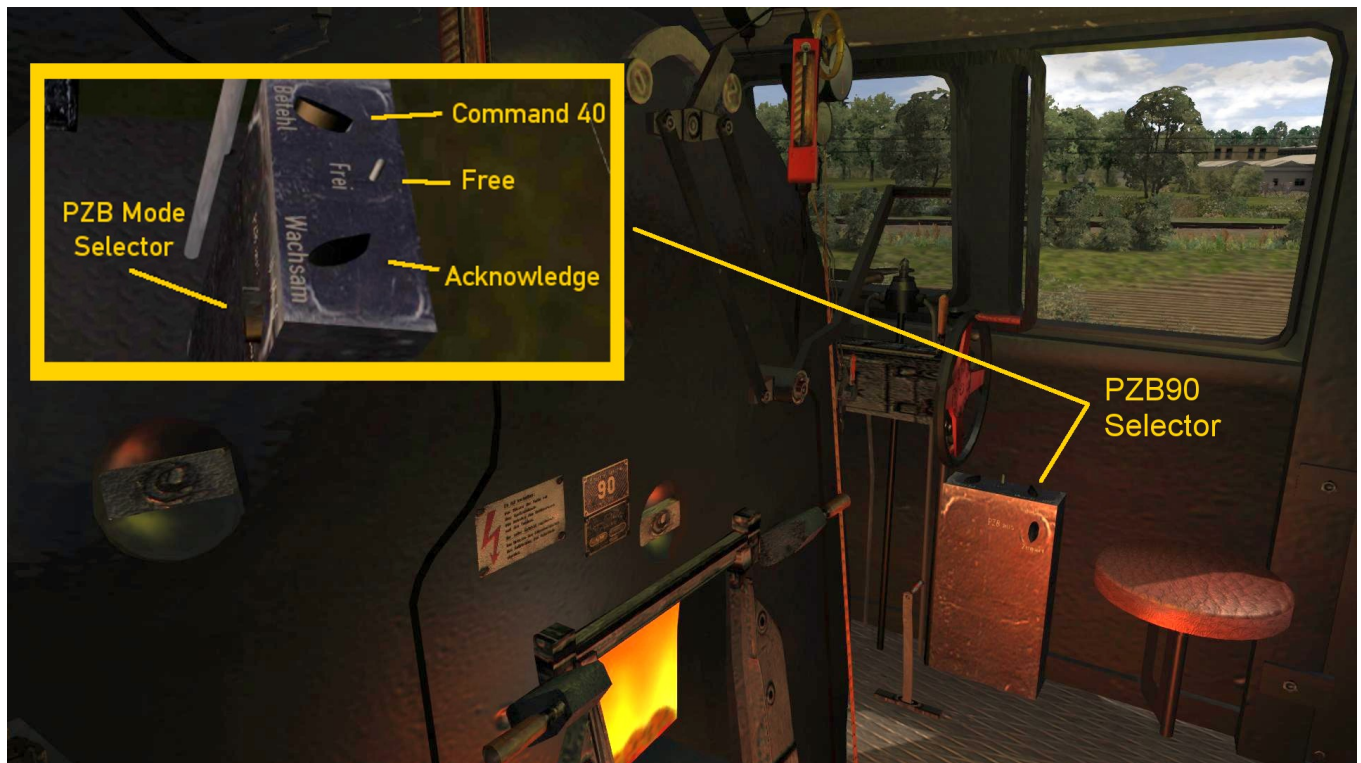


This *Romantic Railroads* class BR24 features a fully functional **PZB90** system.

By selecting one of the active train-modes “**U 55**”, “**M 70**” or “**O 85**” you will also select **all special functionalities** (see below).

You can only set the PZB modes or switch it off when the train is stopped.

The **'Page up'** and **'Page down'** keys or the switch of the PZB Controller toggle these modes in sequence.



The PZB mode indicator is mounted above the speedometer. (see picture).



PZB90

PZB is short for *Punktförmige Zugbeeinflussung*, its function is more or less similar to the UK AWS function but the system continuously calculates the braking distance to the next signal at danger and if the train speed is too high to brake in time, the emergency brake is applied.

The PZB90 system is disabled at startup, but can be activated by pressing 'Page Up' or deactivated by pressing 'Page Down' (only at standstill). The system now is active for train type U 55. By pressing 'Page Up' again the train modes can be switched upwards to M 70 and finally to O 85. Pressing 'Page Down' will switch the reverse order.

The maximum speed of all train-modes are controlled as well and are:

“U 55“ - 105 kph

“M 70“ - 125 kph

“O 85“ - 165 kph

There are three cab controls associated with the PZB90 system:

Befehl40 / Override,

Frei / Free and

Wachsam / Acknowledge

When passing a distant signal set at warning, the yellow '1000' indicator will light up. The signal must be acknowledged, using the Acknowledge key 'Q' within 4 seconds after passing or the emergency brakes will be applied.

If it is required to pass a red signal, press and hold the Override key 'Del' before passing the signal. Make sure that the train speed is below 40 kph.

By passing the signal, the white 'Befehl 40' light will show. When this 'Befehl 40' is lit the Override key can be released.

When starting the PZB90 system, the lights 70 and 85 flash alternatively to show the system is initialized. If there is no signal at danger ahead you may press the Free key 'End'.

When in restrictive mode (calculated brake curves active) either or both '1000' and '500' lights are lit.

If the restrictive monitoring has ended ('1000' and '500' lights are off) and there is no signal at danger ahead of you, the monitoring can be cancelled using the Free key 'End' again.

The very complex behaviour of this German safety system is described in more detail in different languages on the Internet.

e.g. English: http://en.wikipedia.org/wiki/Punktförmige_Zugbeeinflussung

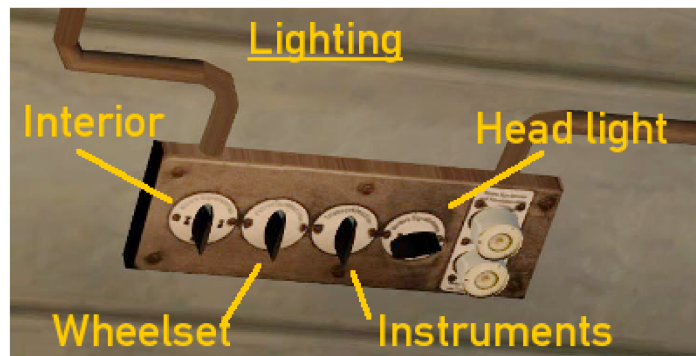
Key Assignments and Special Conditions:

Function	Key	Action	Remarks
Regulator	a	increase	faster
Regulator	d	decrease	slow down
Reverser	w	increase	In position 0 to 100 forward
Reverser	s	decrease	In position 0 to -100 reverse
Light	h		1x h = front white / rear red → forward 2x h = front red / rear white → reverse
Light	Shift h		As above, in reverse order
Fire door	f	open	
Fire door	Shift f	close	
Stoking rate	r	increase	The actual rate is shown by the coal amount on the shovel in Cab View
Stoking rate	Shift r	decrease	The actual rate is shown by the coal amount on the shovel in Cab View
Cylinder cocks	c	open/close	
Maintenance-openings	z	open/close	open/close Water hatches on Tenders and sanddome lid on the engine.
Sliding window and front window	v	open/close	open/close Sliding and front windows
Taking coal Taking water Taking sand	t	open	With this key you can fill locos and tenders, if near transfer-points.
Sander	x	open/close	In external view the sanding can be observed
Whistle	space		The length of the whistle-sound depends on the duration of the key press.
Bell	b	on / off	
Blower	n	increase	
Blower	Shift n	decrease	
Ashpan damper	m	open	Increases the fire amount by letting fresh air in.
Ashpan damper	Shift m	close	With open dampers, sparks can be observed in external view.
Water feed pump	o	open/close	Only the pump will be activated. The amount has to be set with key l / shift l.
Injector	i	open/close	Only the injector will be activated. The amount has to be set with key k / shift k.
Feed Pump Rate	l	increase	
Feed Pump Rate	Shift l	decrease	

Injector Feed Rate	k	increase	
Injector Feed Rate	Shift k	decrease	
Train brake	`	increase	
Train brake	;	decrease	
Loco brake	[	increase	
Loco brake	]	decrease	
Instrument lights	- Minus	on / off	
Interior lights	. Period	on / off	Interior lights only switchable, when the generator is running (key y)
Generator	y	more steam	
Generator	Shift y	less steam	
PZB90			
Train modes	Page up	increase	From “ off ” to “ U 55 ” > “ M 70 ” > “ O 85 ”
Train modes	Page down	decrease	From “ O 85 ” > “ M 70 ” > “ U 55 ” to “ off ”
Acknowledge	Q		Standard as well as Expert
free	End		
Command 40	Del		

Generator and Light switches

The interior lighting and the wheelset lights can only be switched on when the generator is running.



Additional Expert Functions when **PZB90** is set to “on”:

Priming:

If the boiler becomes overfilled with water, water may enter the cylinders. This phenomenon, which is known as priming, can cause damage to the cylinders, since water can't be compressed.

In the RomanticRR BR24 this behaviour has been implemented by scripting. It initiates emergency braking and the cylinder area is covered in steam:



This priming does not mean the end of the loco ride, just like in reality. The real crew had to replace cylinder relief washers or repair other minor damage.

In the simulation, you must regain a healthy water level by steam usage which is tolerated for the ride (optimal boiler fill below 1.0). Then the simulation assumes a successful repair and you can continue your ride.

Boiler Explosion:

It is unacceptable to drive a steam locomotive when the water level in the boiler is too low. If the water level falls below the safety level and the locomotive is still moving, a (usually fatal) boiler explosion may happen.

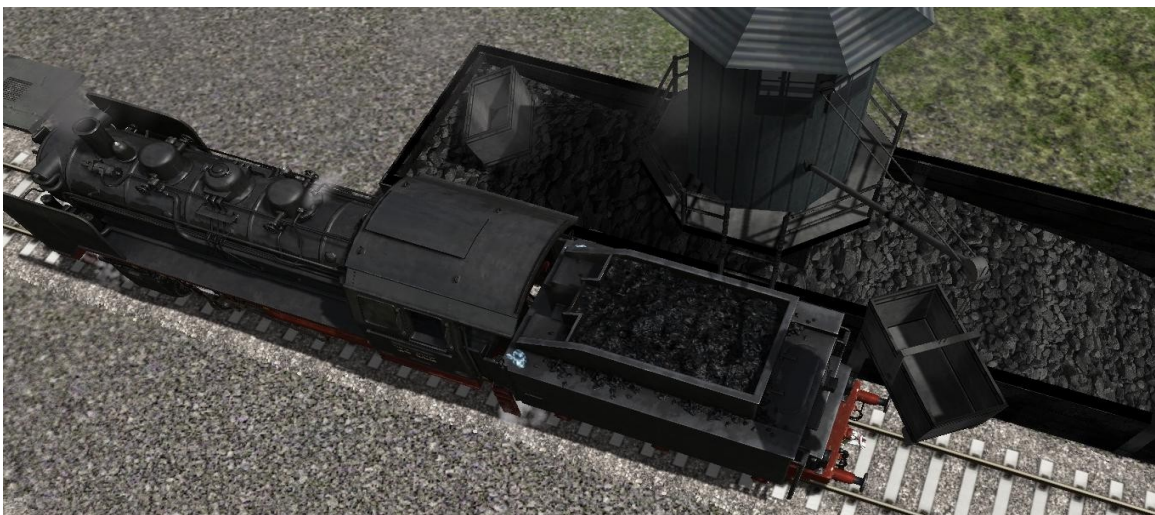
This will prevent the game from continuing.

In the RomanticRR BR24 simulation this boiler explosion looks like this after the emergency brake is applied:



In addition to the described locomotives, a complete maintenance facility (loco shed, water crane, coaling and sanding tower) is included:





There are five scenarios included in this *Romantic Railroads* Add-On pack. Two career and three tutorial scenarios for the DTG route “Hamburg to Hanover”.

Additionally the engines can be used on any quick-drive enabled route already in different configurations according to your personal taste.

Details of the scenarios:

Hamburg to Hanover Route:

Tutorial Scenarios:

[Tut] BR24 Standard

Learn how to drive the steam locomotive class BR24 using the Standard functionality. Practice also taking water, coal and sand.

[Tut] BR24 Expert PZB 1

Learn how to drive the steam locomotive class BR24 using the Expert functionality in switching on the PZB90 system. Learn how to use this PZB system in a special case.

[Tut] BR24 Expert PZB 2

Learn how to drive the steam locomotive class BR24 using the Expert functionality in switching on the PZB90 system. Learn how to use this PZB system when entering the station of Uelzen.

Career – Scenarios:

BR24 Museum Uelzen

You are the driver of the class BR24 and your task is to take empty freight wagons to a wagon collecting point. You may drive this scenario with or without the PZB90 system.

BR24 Going home

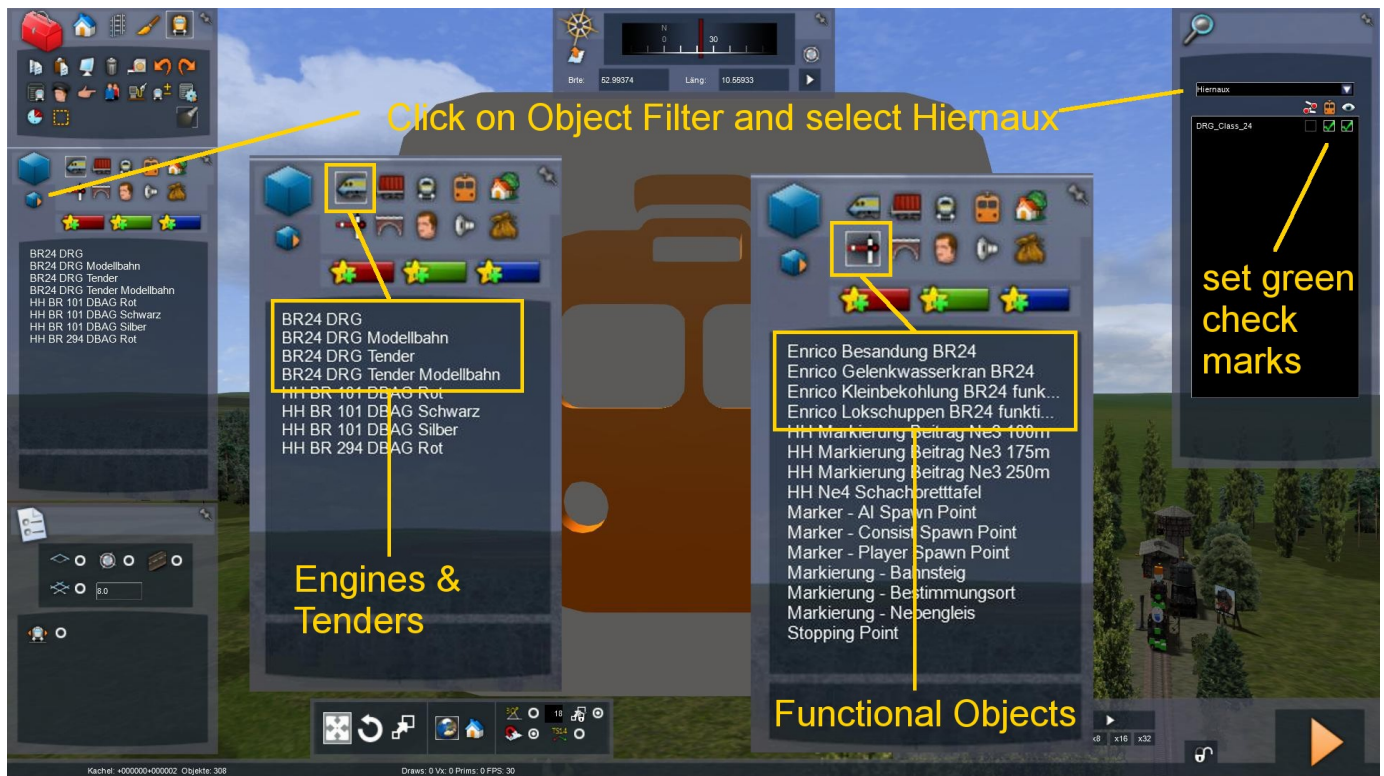
You are the driver of the class BR24 and your task is to take some loaded freight wagons back home to the museum. Afterwards you have to fill the tender with fresh water and coal and the engine with braking sand. You may drive this scenario with or without the PZB90 system.

Create your own scenarios:

Object filter **Hiernaux**:

DRG_Class_24, enable by green check mark.

All steam locomotives and the functional maintenance facility are to be found under the icons: locomotives and track side infrastructure.



Now have a lot of fun using this *Romantic Railroads*
Add-On for Train Simulator 2016 “*Legends on rails*”



BR 24 „Prairie Horse“

References:

- Hansjürgen Wenzel: Die Baureihe 24 / Die kleinste Einheits-Schleppenderlok, EK-Verlag, Freiburg, ISBN 978-3-88255-124-2
- Konrad Koschinski, Baureihe 24, Eisenbahn Journal Special 1 2015, VGB Fürstenfeldbruck, 2015
- Various articles in other books and magazines
- Internet (Wikipedia License <http://creativecommons.org/licenses/by-sa/3.0>)

Acknowledgements:

The authors would like to thank the following people for their contribution to the development of the BR24.

Advices about the railworks engine & support:

- Edward Gates (DTG)
- Jon Stewart (DTG)
- <http://thegradecrossing.blogspot.be/search/label/Tutorial%20Index>

Graphics technical advice:

- Cedric Storm
- Franck Sauer

Active general support and encouragements:

- Fabrice Lété
- L  titia Lambrechts
- Fran  ois de Bue
- <http://www.railsim-fr.com/> and all forum members

DTG Beta Testing Team

Note:

Some pictures used are from the development phase and may differ from the final version.