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Information

Bavarian S 3/6

The Class S 3/6 steam locomotives of the Royal Bavarian State Railways (later Class 18.4-5 of the Deutsche Reichsbahn) are express train locomotives with a 4-6-2 Pacific (Whyte notation) or 2'C1' (UIC classification) wheel arrangement.

Of all the state railway locomotives, these engines are remarkable because they were made over a period of almost 25 years, even during the Deutsche Reichsbahn era. A total of 159 units were manufactured, more than all of the other state railway Pacifics put together. 89 of these locomotives (Series a to i) were built for the Royal Bavarian State Railways and 70 (Series k to o) for the Deutsche Reichsbahn.

Class 18 505



Because standard locomotives had still not been built, the Reichsbahn continued to produce the proven S 3/6. In 1923 and 1924 Maffei supplied the series k with a total of 30 engines. They were given operating numbers 18 479 to 18 508. They differed from the earlier series: technically, because of a somewhat larger super heater, and optically, with a driver's cab without a Windschneide, but whose side walls were angled in the area of the windows as on the later standard locomotives. Several were supplied to the Wiesbaden engine shed in order to haul the 'FD' long-distance express train, the Rheingold.

Locomotive 18 505 is in the railway museum of the German Railway History Company (Deutsche Gesellschaft für Eisenbahngeschichte e. V. or DGEG) in Neustadt an der Weinstraße on the 'wine route' where it can be viewed. The last of these engines, no. 18 508, is in private ownership and stabled in Switzerland. (Locorama Romanshorn).

Class 18 50X



18 50X represents the remaining 29 locomotives, built 1923-1924 Series K (18479-18508). Those were the last Series of 18, which were still appointed by the "Royal Bavarian State Railways" (S 3/6 S 3/6 3680 to 3709), so the last genuine Bavarian S 3/6. They were built by the company J.A.Maffei Munich, among factory numbers 5448-5558. Over the years a number of design changes have been made to the machine to always keep up to date. Smoke deflector from approx. 1929, electric lighting in 1928, improved brakes from 1934, Indusi from 1938, third train headlight from 1955, increasing the boiler pressure of 15 to 16 Bar in 1928 and more.

Technical specifications

Technical specifications:

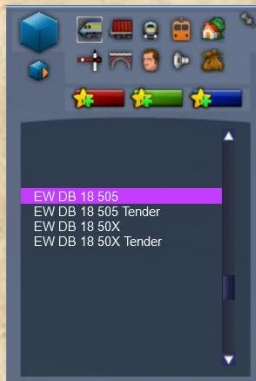
Wheel arrangement:	2' C 1' h4v (Pacific, superheated steam, 4 Cylinder, Composite engine)
Length over buffers:	22.842 mm with Tender 2'2'T31,7
Service weight :	165,7 t with Tender 2'2'T31,7
Power:	1830 PS / 1346 KW
Top speed:	120 Km/h
Driving wheel diameter:	1870 mm
Leading wheel diameter:	950 mm
Trailing wheel diameter:	1206 mm
Boiler Pressure:	16 bar
Grate area:	4,53 m ²
Evaporative heating area :	197,41 m ²
Super heater area:	74,16 m ²
Axle load:	18,5 t
build year:	1924
Water capacity:	31,7 m ³
Coal capacity:	9 t

Power Panel:

This power table was fitted on all the locomotives of the series K (18461-18508).The table provides information about which weight could be carried on a given slope and at what speed.

Km/h	50	60	70	75	80	85	90	95	100	110	120
Gradient	Train weight in tons										
0 ‰						1000	875	750	640	440	320
1 ‰					900	800	680	600	500	355	260
2 ‰			940	830	730	635	560	480	420	300	215
3 ‰		970	765	690	610	530	470	400	350	250	180
4 ‰		825	650	580	515	450	400	340	300	210	150
5 ‰	880	710	560	500	440	390	335	290	250	180	125
6 ‰	760	615	490	425	380	335	290	245	210	150	100
7 ‰	670	530	420	375	330	290	245	220	180	130	
8 ‰	595	470	370	330	300	260	220	190	160	110	
10 ‰	475	380	300	265	230	200	170	140	120		
14 ‰	325	260	200	170	145	125	105				
20 ‰	205	165	110								
25 ‰	130	100									

Locomotives and Tender



Locomotive 18 505 (Pacific) 4-6-2

2'C1'h4v- express locomotive of "Deutsche Bundesbahn" Class 18⁵ with INDUSI i60.



Tender 18 505

4 Axle Tender 2'2' T 31,7 of "Deutsche Bundesbahn".



Locomotive 18 461 to 18 508 (dynamic numbering)

2'C1'h4v- express locomotive of "Deutsche Bundesbahn" Class 18⁵ with INDUSI i60.

The number 18 506 is specified, but can be changed!



Tender 18 461 to 18 508

(dynamic numbering)

4 Axle Tender 2'2' T 31,7 of "Deutsche Bundesbahn".

The number 18 506 is specified, but can be changed!

Use in scenarios

Due to the high level of detail the locomotives of the series 18⁵ are ideal as player engine for consists in scenarios. But it can also be used as a Dispatcher controlled AI engine or as "Dead Engine". With 18 50X you have the option to put several BR 18 on the track, since this variant has dynamic numbering. Without changing the 18 50X and her tender is always placed in the simulation with the number 18 506. However with the 18 50X and its tender you have the possibility to change the number. With 18 505 and its tender this is not possible

If you want to use the locomotives and tender in a separate scenario, you must activate the installed Eisenbahnwerk AddOn05_BR-18 for this scenario.

Driving in simple mode



With the HUD Power slider **1** you control the force applied with the brakes, when the Slider is in zero position and there is no drive power is available, the brakes are released. The farther the slider is moved in the direction of 100%, the greater the braking force, so 100% triggers full braking. When the Regulator slider is moved in the positive range, it increases the power of the locomotive up to full power.

Whilst standing locomotive the direction can be set with the drivers Reverser. **2**

With the emergency brake **3** the train can be brought to a halt sooner in dangerous situations.

Please note: In simple mode, the brakes need about 5 seconds until completely released! So before starting first bring the slide switch to 0% position and wait until the pressure in the brake cylinders has dropped to 0 kg / cm². Now the brake is fully released and you can gain speed.



We recommend to drive the locomotives always in expert mode!

The performance of a steam locomotive is determined by the pressure of the boiler. The boiler can only produce a certain amount of steam (approx. 16t/h). But if you consume more steam than this, the pressure in the boiler will decrease until the engine comes to a halt due to lack steam. The real challenge when driving a steam locomotive is to economize with the generated steam, so that the boiler pressure stays as high as possible. For the steam train drivers there are two controls available, the regulator and the reverser wheel. With the regulator the pressure is regulated with which the steam pushes on the piston and with the reverser wheel, the amount of steam is regulated which is flowing into the cylinders. These two factors determine both the power and the steam consumption of the machine. Of course, the speed plays a big role, because the faster the locomotive moves the more steam it consumes

Start up:

When starting the engine requires a lot of strength but the speed is very low, so we can set the Reverser on full forwards (80% more is not possible). Now we release all brakes and wait until the pressure in the brake cylinders has dropped to zero kg /cm². Now the regulator is slowly opened and the locomotive starts moving. Now the cylinder drain cocks should be opened to allow the condensation to drain away from the cylinders. After 1 or 2 turns of the wheel the cylinder drain cocks can be closed again. Maybe the wheels start to spin (wheelslip), then we reduce either the regulator or operate the air sander until the spinning stops. At 80% reverser, fully open regulator and a speed of about 20 km/h, the steam consumption is higher than the steam generation it is now time to reduce the reverser to reduce the filling of the cylinder until the steam production exceeds consumption.

When starting on steep grades, we recommend that you first open the regulator and then to release the brakes to prevent rollback of the train. In this case one should also not forget to open the cylinder drain cocks for 1 -2 wheel turns.

Driving:

On level ground, we will gradually reduce the reverser until we reach the maximum speed of the locomotive at about 40% reverser and fully open regulator until steam consumption and steam production are in balance.

On steep ramps the possible maximum speed of the locomotive is reduced, depending on the train weight. The power table gives us a clue about the achievable speed, depending on the train weight and the slope. Steep inclines are driven with regulator fully open, the reverser has to be set higher to maintain speed, steam consumption and steam production are consistent. Sometimes the speed can drop to 50 km/h at 60% reverser. It is just important, that the boiler pressure doesn't drop too strong but remains as constant as possible.

Driving with tender ahead:

If the control (reverser) is set to negative values, the locomotive is moving backward. But notice that the BR 185 is a thoroughbred express train and usually moves forward only when maneuvering with the Tender. Of course, it may be that no turntable is available to turn the locomotive and the engine has to pull its load backwards, but then a speed limit of 50 km/h applies.

Brakes:

The locomotive has a compressed air brake, in addition to the tender equipped with a counterbalanced hand brake. If the locomotive itself (shunting or rendition) can be braked by the auxiliary brake valve. With the additional brake valve, compressed air is fed directly from the main reservoir into the brake cylinder, so the pressure in the brake pipe is not reduced, however, with this brake only the locomotive will be braked. The actual service brake is controlled via the driver's brake valve. If the driver's brake valve placed in the locked position, the pressure in the brake pipe is lowered, resulting in a rise in pressure in the brake cylinders, the engine and the whole train is braked. The braking force can be continuously increased, but not continuously reduced. If one wants to reduce the braking force, the brake has to be released completely.

The counterbalanced brake of the tender serves as a parking brake.

Firing

The fireman:

In real life the heating of a steam locomotive is quite an art and requires years of experience. The firemen shoveling not only tons of coal in the fire hole, but is also responsible for the boiler. He takes care that there is always enough steam available for the train driver, but must also carefully use the resources of the machine. In earlier times there were rewards for train crews for driving sparingly and penalties for wasting. The most important in a steam boiler is the water, because if the water level in the boiler drops too low, can "burst" the boiler. As already mentioned, the boiler of the BR 18 can produce about 16 tons of steam per hour. So the engine consumes 16,000 liters of water at maximum power. Therefore the fireman must always ensure that enough water is fed into the boiler.

The water level must also not be too high, as this can lead to "hydraulic" of cylinders. When hydraulic happens liquid water together with steam enters to the cylinders, since water cannot be compressed as a liquid, it can cause serious damage to the motion. The fireman thus has a great responsibility and has to perform key tasks.

In the simulation you activate automatic fireman. Then you can concentrate on the route observation and compliance with the timetable. If you want to get the best performance from the locomotives and increase the difficulty of the simulation, you should use the shovel in your hand fire the engine by yourself.

If you drive using the HUD, injectors and feed pump can only be operated via the HUD. Only if the HUD is off, will you have full access to these functions.

Injectors:

Make sure that the water level in the boiler does not decrease too much, but also not overfilling the boiler. The water level should not exceed 98%, otherwise it could lead to hydraulic and damage to the locomotive. If the boiler is overfilled, open the cylinder drain cocks and reduce the regulator back slightly. Continue until the water level has fallen again and close the cylinder drain cocks again. The injectors also consumes steam, which you might need. Try to use the injector whenever possible when there is no demand of power for engine, for example at station holding or in gradients.

Firing:

In the firebox of the coal level should be above 80%, only then the locomotive can produce its full power. Before you drive your locomotive in a tunnel, finish the firing and close the firebox doors, otherwise there will be a flashback and the ride is over. So never fire in the tunnel.

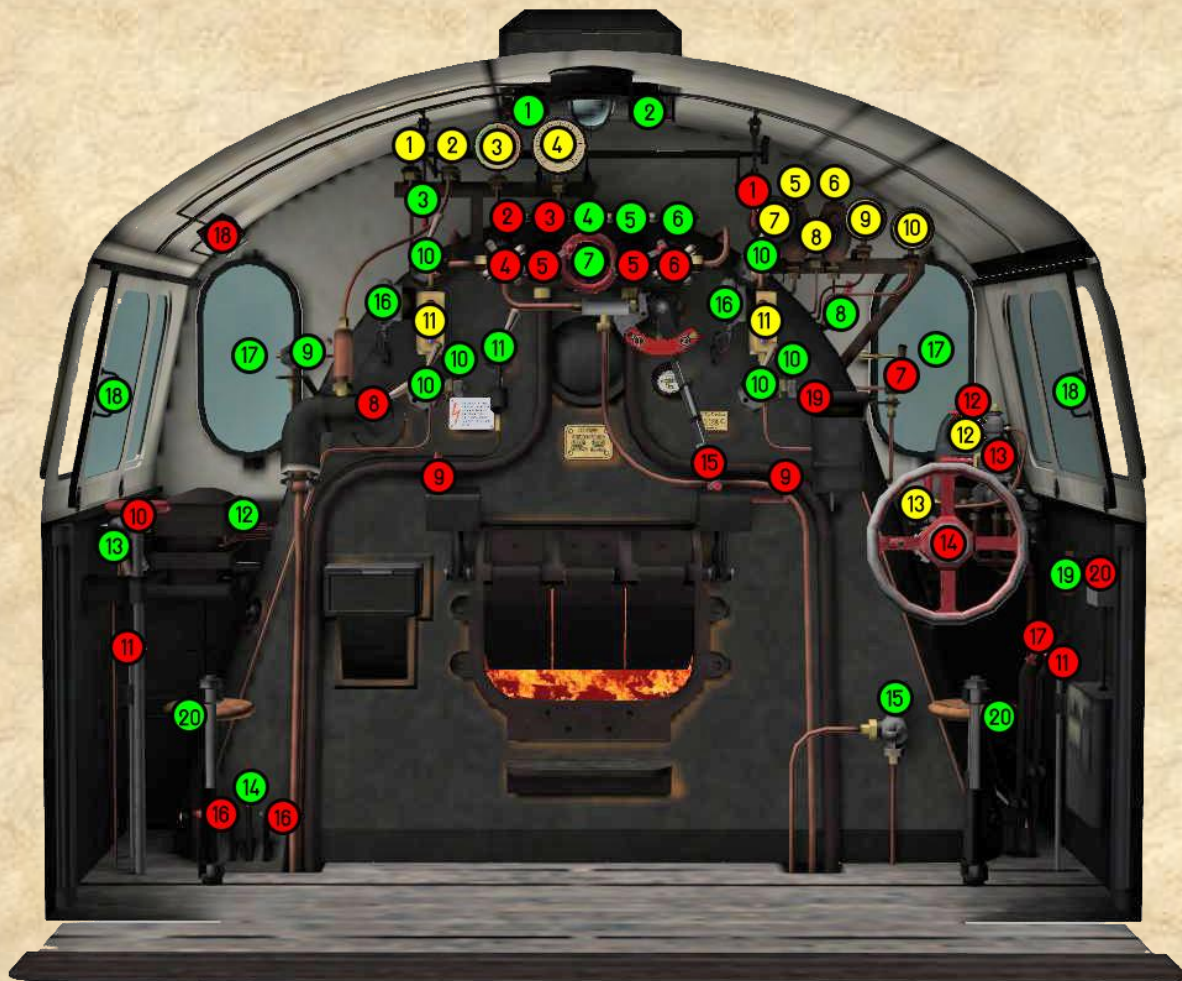
Blower:

At a longer stop of the locomotive the fire is not fueled properly because no cylinder blast of steam is produced. In this case, turn on the blower. This ensures a negative pressure in the smoke box and the fire is drawn through.

Damper:

If you take over the locomotive, the dampers are open. By closing the dampers the fire gets less oxygen. In real locomotives it certainly makes sense after a rapid ride to close the dampers at the station and thus to calm the fire. But in the simulation it can be advised to close of the damper, since thereby the steam production of the boiler is reduced.

*Information: Do not worry if the boiler pressure rises slightly above the 16 kg/cm² mark.
Statement by Emil (retired steam engine driver): "On all locomotives in my time the pressure settings were set 1-1.5 bar above the operating pressure."*

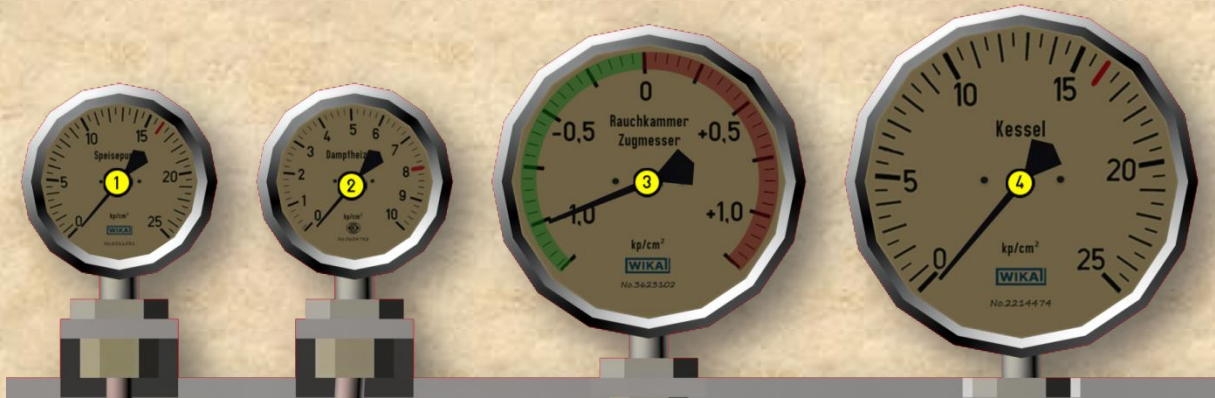
Cab


Instrument and display	
1	Feed pump
2	Steam heating
3	Vacuum gauges
4	Boiler pressure
5	HD control valve assembly
6	Connector
7	Pyrometer
8	Main air reservoir
9	Brake cylinder
10	Main air pipe
11	Water level
12	Speedometer
13	Cylinder filling

Important controls	
1	Whistle
2	Auxiliary blower
3	Turbo generator
4	Feed pump steam
5	Injector Steam
6	Air pump
7	Pneumatic sander
8	Steam heating
9	Firebox Door
10	Feed pumps water
11	Injector water
12	Locomotive brake
13	Train brake
14	Reverser with lock
15	Regulator with lock
16	Damper
17	Drain Cocks
18	Electrical switchbox
19	Light switch Tachometer
20	Inductive Train Protection

Animated but without function	
1	Front roof flap
2	Rear roof flap
3	Safety valve
4	Rerouting
5	Lubrication pumps Heating
6	Air intake valves
7	Main Steam valve
8	Connector
9	Smoke box sprinkler
10	Gauge Frame Blow Down
11	Diverter valve
12	Oil Pump manual override
13	Coal Sprinkler
14	Bottom flap
15	Ash pan sprinkler
16	Water Gauge lights
17	Pivot window
18	Sliding window
19	Pressure equalization
20	Swivel stool

Instrument and display



Feed pump: ①

The pressure gauge displays the supplied steam pressure to the piston feed pump. The pump has a maximum flow rate of 250 l / min.

Steam heating: ②

Here the Fireman can check whether and with what pressure the train steam heating is supplied with steam.

Vacuum gauges: ③

The smoke chamber diameter shows the negative pressure in the smoke chamber. By exhaust installation, a vacuum is created in the smoke chamber, passing fresh air through the damper through the grate and into the fire. It also prevents flash back through the fire door and endangering the locomotive personnel. The vacuum is not continuous but intermittent as the exhaust emits steam.

Boiler pressure: ④

This gauge indicates the pressure in the boiler. The boiler is approved for a Safe Working Pressure (SWP) of 16 bar. When the boiler pressure is too high, the safety valves open and protect the engine against a boiler explosion. Make sure that the pressure in the boiler is not too low, because the steam pressure is power. If you drive the boiler empty, you have no choice but to stop and "boil water" until you have enough steam pressure again.



Pyrometer: 5

The pyrometer is a remote thermometer, and measures the temperature in the superheater. You have no direct influence on their value. The superheated steam should have a temperature between 300 ° and 400 ° Celsius.

HD control valve assembly: 6

Displays the pressure in the high-pressure valve body. This is at most as high as the boiler pressure. The pressure in the valve body changes depending on the control position of the control and speed of the locomotive.

Connector: 7

After the steam has done its work in the high-pressure cylinders, it flows into the connector and then only in the low-pressure cylinder. During start-up, in order to increase the torque, steam is directed into the connector (max. 9bar). This happens automatically when the control is set to >68%. With the connector lever they can turn on the display and check the pressure in the connector.

Main air reservoir: 8

The locomotive has a air brake. The primary air reservoir supplies the main air pipe with compressed air. The pressure in the main air reservoir should always be in a 6 to 8 bars. The pressure in the main air container is shrinking due to smaller losses of air and when venting the brake pipe (loosen the train brake). If the air pump is turned on, the consumed compressed air is automatically supplemented. If the air pump is turned off, or not work at a reservoir pressure of less than 5 bar, the main air line is vented, so initiated an emergency brake. The train-brake can only be released again when the air pump is turned on and the main reservoir is filled.

Brake cylinder: 9

The pressure gauge indicates the pressure in the brake cylinders of the locomotive. The brake cylinder pressure should not rise above 3.8 bar.

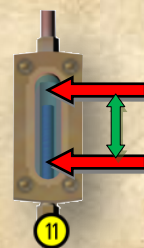
Main air pipe: 10

The train brake is controlled by the main air line. When driving the pressure in the brake pipe is 5 bar and the auxiliary reservoir of the train carriage is filled. When braking, the pressure in the brake pipe is lowered with the driver's brake valve. Thereby the control valves switch and direct pressurised air from the auxiliary air containers to the brake cylinders.

The lower the pressure in the main air line is, the higher the pressure in the brake cylinders is. At a pressure of 3.5 bar in the brake pipe the maximum pressure in the brake cylinders is 3.8 bar. At this very high brake pressure the friction and some wheels of the locomotive would slide. It is important to prevent the wheels from locking, because in real locomotives this could cause serious damage to wheels and drive. For emergency braking, the pressure in the main brake pipe is reduced below 3.5 bar. With the result, that the main air line is completely vented - the pressure drops to 0 Bar. In this way braking is not stronger, but faster!

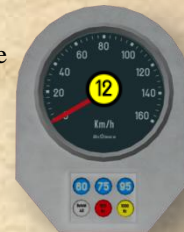
Glass gauge: 11

The locomotive is equipped with two water level displays. One is located on the driver side and the other on the side of the fireman. The water level indicators are the most important instruments in the cab of a steam engine. They indicate whether the right amount is to feed water into the boiler. The water level must not get too high or low. Too much water can lead to the priming up, which can cause serious damage to the machine. In case of low water level, the firebox can anneal, resulting in the worst case to a boiler explosion.



Speedometer: 12

The speedometer shows the current speed. Also in the speedometer there are 6 indicators for the Inductive Train Protection (INDUSI). This is explained in another chapter.



Reverser: 13

The scale shows the layout of the control in percent. When starting control is set high, with increasing speed take the control back towards 0.

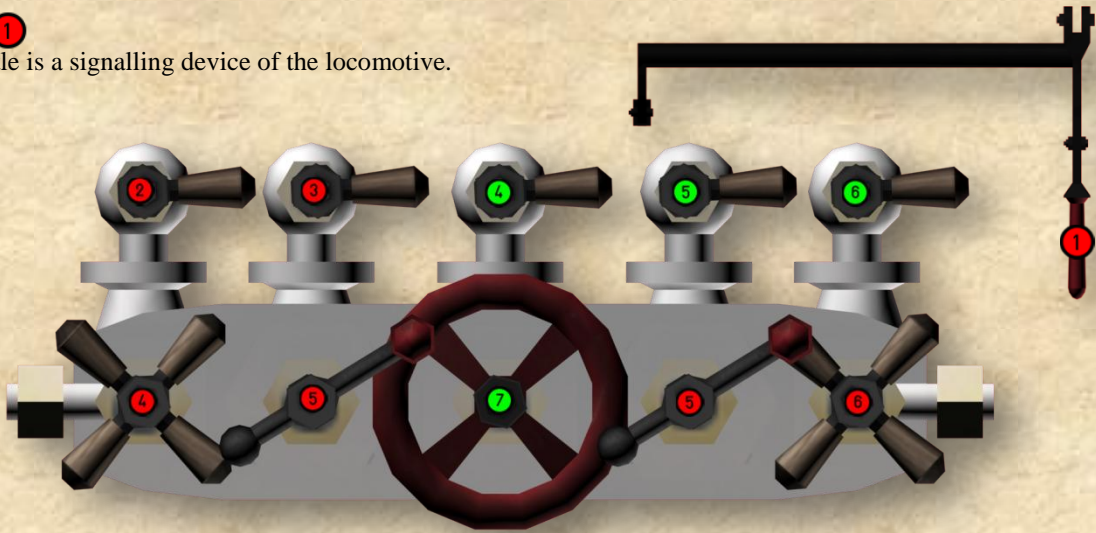
The BR 18 with wagons as a train and control set between 40% and 50%, a good compromise between consumption of steam and power can be achieved.



Important controls

Whistle: ①

The whistle is a signalling device of the locomotive.



Auxiliary Blower: ②

The auxiliary blower is an annular pipe with small nozzle, which surrounds the Blast pipe mouth. It serves to maintain the negative pressure in the smoke chamber, when no cylinder steam exists, i.e. at standstill or driving with closed throttle. Then steam can be directed into the auxiliary blower to fan the fire.

Turbo Generator: ③

The turbo generator is a steam-powered Dynamo and supplies the engine with power. It delivers 500 watts at a voltage of 25 volts. If the generator is switched off, light and Indusi do not work!

Feed Pump Steam: ④

Adjusts the steam supply to the feed pump. To feed the boiler, the water supply is released first and then applies the pump with steam. With the pressure gauge ⑧ the function of the feed pump can be controlled. The pump provides 250 l / min.

Injector steam: ⑤

Adjusts the steam supply to the Injector. To feed the boiler water is released first and then passed to the steam injectors. The steam jet pumps provide 300 l / min.

Note: The functions of feed pump and Injector steam as well as their water supply do not match 100% with the original model. The machine has in fact two independent steam injectors and a piston feed pump.

Air Pump: ⑥

The air pump fills the main air reservoir with compressed air. If it is turned on, it does this automatically, as soon as the tank pressure becomes too low. When the air pump is switched off, the consumed compressed air cannot be refilled anymore. The pressure gauge ⑧ indicates the pressure in the main reservoir.

Compressed Air Sander: ⑦

In wet or slippery tracks there is a risk that the engine wheels spin at start or sliding whilst braking. With the compressed air sander train drivers can spread fine quartz sand in front of the friction- and dome wheels. This increases the friction and skidding or slipping can be avoided. Over switches sanding is prohibited. In the simulator the sand supply is unlimited!



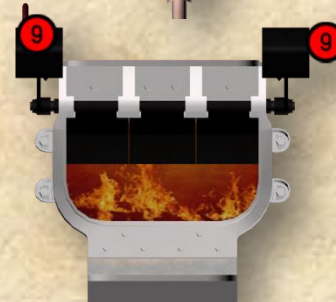
Steam heating: 8

Since the engine is designed for high-quality long-distance and passenger traffic, it certainly is equipped with steam heating. Thus, the carriages can be heated if required. Like the original, only a pipe at the buffer beams of the tender is available. The vapor pressure in the heating can be controlled with the manometer. 2 You can adjust the pressure of the steam heater continuously between 0 bar and 8 bar.



Firebox doors: 9

The firebox doors closes the firebox against the cab. It should really only be opened to fire, as with when you open the firebox damper the negative pressure in the smoke box aspirated fresh air no longer, but sweeps over the fire bed. With firebox door the sound of the exhaust noise is weaker, the negative pressure in the smoke box is less, because of poorer combustion, black smoke will be emitted from the chimney. If you go without the automatic fireman in the game and even want to heat the locomotive, do not forget to close the fire door in a tunnel. Otherwise, the simulation is terminated due to flashback.



Feed pump water: 10

In order for the piston feed pump to work, with this 4 valve the feed water supply is opened. Only then the pump with the valve can set in motion.

Jet pumps (injectors) water: 11

Even with the steam jet pumps only the water supply 5 to the pumps must be opened before the injector steam valve is opened. Since the model locomotive both on the left side (heater), as well as on the right side (engine driver) has an injector, the associated valves are duplicated.



Locomotive brake: 12

The so-called auxiliary brake valve does not affect the pressure in the brake pipe, but directs compressed air from the main reservoir to the brake cylinders of the locomotive. Ideal for single-driving locomotives for shunting or in situations, where not the full braking force of all rolling stock is required. The maximum pressure in the brake cylinders should not exceed 3.8 bar, from about 3.5 bar the engine starts to slide.

Train brake: 13

With the driver's brake valve "Knorr No.8" the pressure in the brake pipe can be gently, or in emergency situations also abruptly, reduced. If the pressure drops in the brake pipe, the entire train is braked. To release the brakes, the valve needs to be brought into the release position, a gently withdraw is not enough.

Reverser wheel: 14

With the reverser wheel the direction and amount of filling of the steam cylinder is set.

The scale ranges from -80% over 0% to + 80% cylinder filling. The higher the cylinder charge, the greater is the pressure on the piston, but also the main Steam consumption. At start you will need a large filling to speed up the train. The faster you go, the more you will take back the reverser. For a fast ride on a fast train a good value will be between 40% and 50%. Since the boiler is not overwhelmed and the tank pressure can be kept constant for a long time. Negative values indicate reverse.

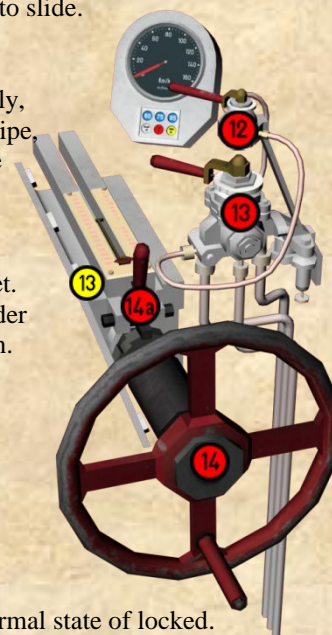
Reverser Lock: 14a

On the original model the reverser is always secured by a latch to stop rotation!

If the train driver wants to change the filling, he must first release the reverser lock.

In the simulator model this has shown to be impractical, so the lock is NOT in the normal state of locked.

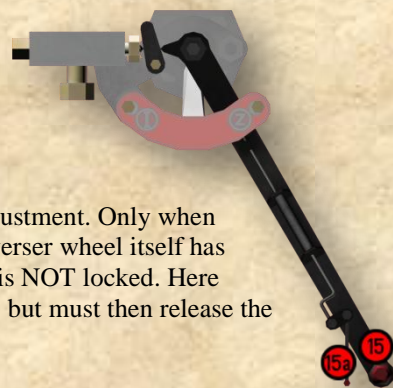
If you like to have it realistic, then you can apply the latch. But then you have to loosen the pawl before any adjustment of the control.



When the control does not turn, then check the position of the lock!

Regulator: 15

The valve controls the steam dome and is operated with the regulator lever. With the regulator lever, you can control the steam pressure acting on the high pressure cylinder.



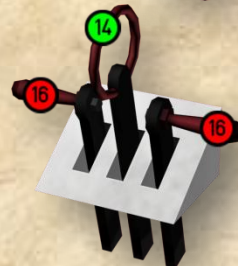
Regulator lock: 15a

On the original model the regulator lever is locked against unintentional adjustment. Only when the train driver releases the lock, the regulator can be adjusted. Like the reverser wheel itself has proven to be very impractical. Therefore the controller in normal condition is NOT locked. Here was well the "hardcore" train driver have the possibility to activate the lock, but must then release the lock before changing the control setting.

When the lever does not move, check the position of the regulator lock!

Damper: 16

The damper are located at the ashpan and they regulate the fresh air supply to the fire. If the damper is open the fire gets a lot of oxygen and is fanned, this causes the steam production of the boiler to increase. If after a swift ride one comes in the station, the dampers could be closed to avoid the safety valves lifting.



Cylinder Drain Cocks: 17

When starting with cold cylinders, or with too much water in the boiler, water droplets can reach into the steam cylinder. Since water cannot be compressed, it may cause serious damage in the cylinders of a steam locomotive. To prevent this, when starting you should always open the cylinder drain cocks for 2-3 wheel turns. Even at an excessive water level in the boiler, these drain cocks should be opened. While the cylinder drain cocks are opened, the locomotive cannot develop its full power. The automatic fireman does not care about the cylinder drain cocks, which is for the engine driver to control!

Electrical switch box: 18

The electrical switch box contains the fuses and the rotary switch for the electrical system of the locomotive.

Head- and rear lights: 18a

Rotary switch with 3 positions for the locomotive lighting: Off, forward and reverse travel.



Cab Lights: 18b

Thus, the overhead lighting can be turned on in the cab.

Panning lanterns (water level): 18c

Switch for the lighting of the water level glasses.

Engine lights: 18d

With this switch you can turn on 6 lamps above the running gear to perform maintenance in the dark.



Reading lamp and speedometer illumination: 19

The reading lamp illuminates the timetable holder. In addition, the switch of the reading light also turns on the speedometer illumination. Not corresponding to the original model, but very useful at night.

Note: The layout of the switches and their function does not match the original wiring diagram!

Tender



Tender water level indicator: ①

Based on the red pointers you can see how much feed water still in the Tender is.

Tender spit valves: ②

Open the valves before taking the water. Then do not forget to close them again. If you do not trust the water level display, you can also control the water level by looking into the water box with opened valves.

Tender coal stock: ③

In tough ride the machine can ever consume 2200 kg of coal per hour. But with full coal bunker (9 tons) you don't need to be concerned about it. Maybe you might take over even a engine with an almost empty tender, then you should keep the coal level in mind.

Tender counterbalanced brake: ④



Applied

The counterbalanced brake of the tender is not a service brake, but a pure parking brake, which acts only on the wheels of the tender. This brake should only prevent rolling of the parked locomotive tender unit. You cannot stop a whole train with this brake.



Released

Note: The tender functions (valves and brake) can be controlled via keyboard or mouse!

Indusi

Indusi ON / OFF:

The Indusi can only be enabled or disabled when the locomotive is at **stand still** with the key combination <Shift + 8> b. After switching on a test cycle is run through and the indicator lights flash sequentially. If the indicator lights **12c** for the train-type lights up permanently, the Indusi is ready.

Indusi train type exchange:

The exchange of train type can only be done when the locomotive is at stand still with the key combination <Ctrl + 8>. Each time you press the key combination a short test program is run and switched on the next train type. If the indicator light of the desired train type is permanently on, the Indusi is ready.

Indusi indicator:

Lower train type: 12a

Used when less than 66 hundredths of a brake available, so mainly for freight trains. For these trains a top speed of 100 Km/h applies.

Middle train type: 12b

Used when 66-110 braking percentage are available. Freight- and passenger trains. For these trains a top speed of 120 km/h applies

Upper train type: 12c

Upper train type If more than 110 brake mass percentages are present, the upper train type can be used. Express trains with a maximum speed of up to 160 Km/h.

Command 40: 12d

If you need to pass a stop signal with active Indusi, press the command switch 40 **20c** and an alarm signal sounds. Now you can slowly (40 km/h max.) pass the signal. If your Indusi now indicates the 2000 Hz magnet, the light detector 40 starts to light up and you can turn off the command 40 switches and thereby the warning.

500 Hz: 12e

When crossing an active 500Hz magnet, this detector will light up, indicating that you are now in the 500 Hz monitoring.

1000 Hz 12f

If you run over a 1000 Hz active magnet, for example distant signal in warning position, you have 4 seconds to press the acknowledgement button, **20a** otherwise an emergency brake will be applied. The 1000 Hz detector only lights up after confirming the warning signal with alert.



Indusi switch:

Acknowledgement: 20a

With acknowledgement active 1000Hz magnets are confirmed.

Free: 20b

With free you can get rid of an active 1000 Hz monitoring if the 1000 Hz detector is no longer illuminated, the train-type indicator flashes and the main signal already shows free ride. But if now still another active 500 Hz magnet appears, you are forced to a standstill because of unauthorized liberation. With the free key you also need to reset the Indusi after an emergency brake.

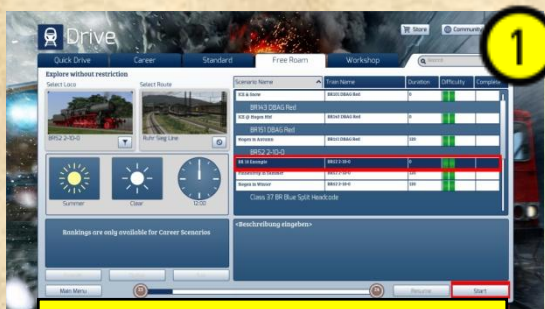
Command 40: 20c

With command 40 you can pass stop showing signals without being forced to a standstill. As long as Command 40 is active, you cannot exceed a speed of 40 Km/h, otherwise an emergency brake will be applied.



Scenario Editor

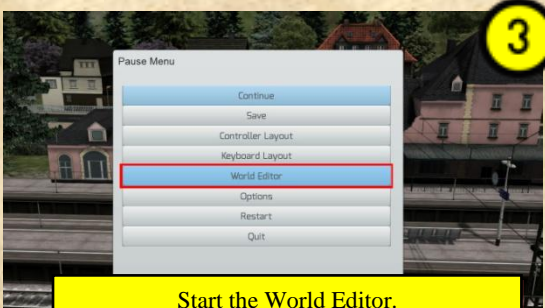
If you activate this add-on for your own scenarios, change the number of 18.50X to your wishes, or want to change the state of the tender supplies, you need to access the scenario editor.



Select and start the desired scenario.



If the scenario has loaded, press the ESC key. Start the World Editor.



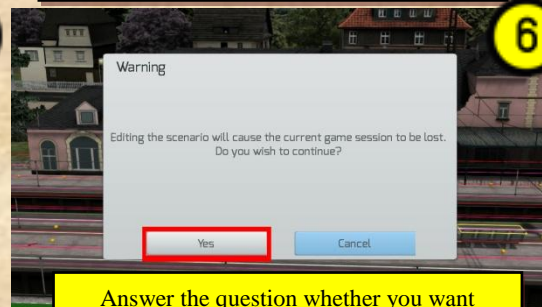
Start the World Editor.



These 3 windows show up when you move the cursor to the left edge.



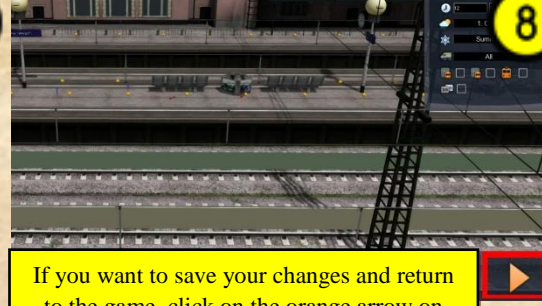
Click in the top window into the scenario tools.



Answer the question whether you want continued with Yes!



You are in the scenario editor!



If you want to save your changes and return to the game, click on the orange arrow on the bottom right

Add-on unlock

To use the locomotives and tender in your own scenarios, the add-on must be activated only in the scenario editor.



Start the Scenario Editor.



Select the Object Set Filter.



Choose Eisenbahnwerk as a developer.



Check AddOn05_BR-18



Select Engines and Tenders.



The rolling stock can now be used in your own scenarios.



Changing locomotives and tender number (only 18 50X)

The locomotive and tender 18 50X are equipped with dynamic numbering, which allows you to change the numbers.



Switch to the scenario editor.



The pre-set locomotive number is 18 506



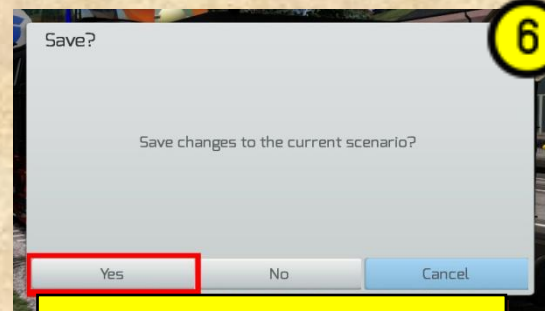
By double clicking on the loco a window opens on the top right and you can enter the new number. Confirm with ENTER.



Proceed with the same way for tender and confirm again the new number with ENTER



If your changes are complete, click on the orange arrow to return to the simulation.



Confirm with Yes to save your changes.

Information: at the Deutsche Bundesbahn (and not only there) locomotive and tender represent a solid unit. Locomotive and tender are interconnected by several couplings and are rarely separated. To comply with the model, the locomotive and tender should always wear the same number. For Series K numbers 18461-18508 would be possible. We recommend 18506-18508, according to the home railway Bw.München.

Adjusting Tender inventories

Adjusting the Tender inventories allows you to simulate operations as coaling or water taking realistic. Because you have this the opportunity you can pass an empty driven locomotive to the player, which he has to refill with supplies before it can do this job.



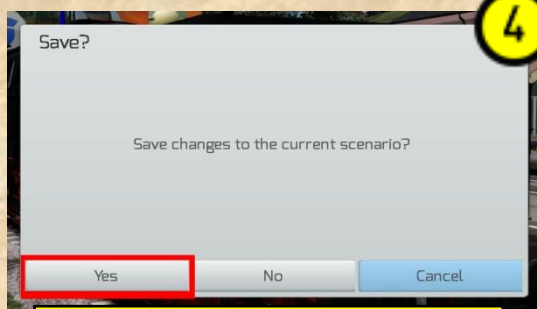
Switch to the scenario editor.



By double clicking on the tender a window will open right above. With the sliders you can now set the starting coal- and water-level.



If your changes are complete, click on the orange arrow to return to the simulation.



Confirm with Yes to save your changes.



Key assignment

Group	Function	Key	
Driving	Regulator lock on / off		Y
Driving	Regulator increase		A
Driving	Regulator decrease		D
Driving	Reverser lock on / off		E
Driving	increase Reverser		W
Driving	reduce reverser		S
Driving	Sander		X
Driving	open / close cylinder drain cocks		C
Brake	Air pump steam		J
Brake	Apply locomotive brake]
Brake	Release locomotive brake		[
Brake	Apply train brake		@
Brake	Release train brake		;
Brake	counterbalanced brake tender		/
Whistle	Whistle short		Space Bar
Whistle	Whistle long		B
Light	Generator off / on	Ctrl	+
Light	Engine lights on / off		U
Light	headlights		H
Light	interior lighting on / off		V
Light	Water level glass lighting on / off	Ctrl	+
Light	Reading lamp and speedometer illumination on / off	Shift	+
Firing	Damper close / open		M
Firing	bottom flap close / open	Ctrl	+
Firing	Auxiliary blower on / increase		N
Firing	Auxiliary blower off / decrease	Shift	+
Firing	firing rate up		R
Firing	Firing rate down	Shift	+
Firing	Firebox door open		F
Firing	Firebox door close	Shift	+
Feeding	Feed pump steam on / off		I
Feeding	water pump on / increase		K
Feeding	water pump off / decrease	Shift	+
Feeding	Injector Steam on / off		O
Feeding	Injector water on / increase		L
Feeding	Injector water off / decrease	Shift	+
Indusi	Indusi Acknowledgement		Page down
Indusi	Indusi Free		End
Indusi	Indusi Command 40		Delete
Indusi	Indusi ON / OFF	Shift	+
Indusi	Indusi Train-type change	Ctrl	+
Steam heating	Steam heating on / increase		P
Steam heating	Steam heating off / decrease	Shift	+
Water	Water flap Tender open / close	Ctrl	+

Addendum

We wish you many happy hours with
Class 18⁵

www.eisenbahnwerk.de

3D modeling, texturing, sounds and LUA scrips: Christian Novak

PR & Administration: Frank Moellenhof

Technical advice: Bernd Heymann, Emil Schueler (retired steam engine driver)

Szenarien: Daniel Wolfram www.dw-agency.de

Soundfiles: www.sonosoundfx.de und www.1soundfx.com

3D characters: www.turbosquid.com



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Scenario package

With the Class 18 four scenarios are included, all of which can be found on the route Koblenz - Trier. This expansion is not included in the package and must purchased separately in the STEAM Store under the name Train Simulator: Mosel Valley Koblenz -Trier Route Add-on, or in the web shop of Aerosoft.

As currently [as 2016] no operable Class 18 is located in Germany, and unfortunately until present there is no historic German railway line in Train Simulator, the tours along the Mosel are fictitious. Nevertheless, the individual tasks, as far as possible, brought to life again the past atmosphere of a journey with steam in the simulation.

In the scenarios besides the rolling stock of Aerosoft also the rolling stock of the European Loco & Asset Pack is used.

[BR18] 01. Smoke, Steam and Snow




Career Scenario

Koblenz -Trier

[BR18] 01. Smoke, Steam and Snow [CS]




DB-BR-18

35

The express locomotive 18 505 was retired in 1969. Three years later, the steam engine has moved to the Neustadt/Weinstraße Railway Museum. Today, the locomotive is in good preservation, but not ready for operation. However, in the simulation everything is possible and so the museum locomotive returns ready for some special trips to the Mosel Valley. On a foggy winter morning, you take a short steam special journey from Traben Trarbach to Bullay. [06th December 2004]

I
EISENBAHNWERK

Winter

Cloudy Snow

10:27

[BR18] 02. Full Steam ahead - Part 1




Career Scenario

Koblenz -Trier

[BR18] 02. Full Steam ahead - Part 1 [CS]




DB-BR-18

50

This year the DB Museum at Koblenz celebrates its three year anniversary and is offering some special events for this occasion. Today there is a meeting of the 'Iron Horses' at the big steam festival. The express locomotive 18 505 will also take part in the celebration and is pulling a special train from Trier through the Mosel Valley to the railway museum at Koblenz. In the first part you will drive from Trier as far as Bullay. [22nd May 2004]

I
EISENBAHNWERK

Summer

Clear

08:57

[BR18] 03. Full Steam ahead - Part 2


Career Scenario

Koblenz - Trier

[BR18] 03. Full Steam ahead - Part 2 [CS]


DB-BR-18

40



This year the DB Museum at Koblenz celebrates its three year anniversary and is offering some special events for this occasion. Today there is a meeting of the 'Iron Horses' at the big steam festival. The express locomotive 18 505 will also take part in the celebration and is pulling a special train from Trier through the Mosel Valley to the railway museum at Koblenz. In the second part you will drive from Bullay as far as Kobern-Gondorf. [22nd May 2004]

I
EISENBAHNWERK



[BR18] 04. Full Steam ahead - Part 3


Career Scenario

Koblenz - Trier

[BR18] 04. Full Steam ahead - Part 3 [CS]


DB-BR-18

25



This year the DB Museum at Koblenz celebrates its three year anniversary and is offering some special events for this occasion. Today there is a meeting of the 'Iron Horses' at the big steam festival. The express locomotive 18 505 will also take part in the celebration and is pulling a special train from Trier through the Mosel Valley to the railway museum at Koblenz. In the third part you will drive on the last section of the route between Kobern-Gondorf and Koblenz. [22nd May 2004]

I
EISENBAHNWERK





And there always be enough water above the firebox...