DB class 232

Inhalt

1 History

1.1 DB class 232

Due to the political climate in the 1960s, the GDR had to stop development of their own diesel locomotives (V180), and import high powered engines from The Eastern Bloc.

First bought was the M62 (V200 / Class 120). This machine could only be used for freight trains because of it's maximum speed of 100 km/h, and lack of any ability to heat passenger trains. Consequently an additional machine with a higher speed limit and train heating supply was needed for passenger trains.

In 1970 Luhansk locomotive works introduced a newly developed locomotive type, most commonly known as Ludmilla, to the GDR. These machines needed a lot of changes to suit the needs of the GDR Reichsbahn.
Several versions were introduced (Class 130 / 131), before finally giving the GDR the machine that they really needed. The class 132 with a max speed 120 km/h and an electric train supply to heat the passenger coaches in winter time. This class became the backbone of GDR diesel traction.

After reunion of both German countries in 1989 the Deutsche Bahn renumbered all Class 132 to DB BR232 and used them for non-electrical routes to drive freight and passenger trains.

Today only a few machines remain in service in with the national companies. A lot of them were sold to private railroad companies.

1.2 Technical Specification

Manufacturer:	Lokomotivfabrik Lugansk	**Construction**:	1970 - 1982
Type:	diesel-electric	**Wheel Arrangement**:	Co-C0
Length:	20.82m	**Weight**:	122t
Power:	3000PS (2200kW)	**Max. Speed**:	120 km/h

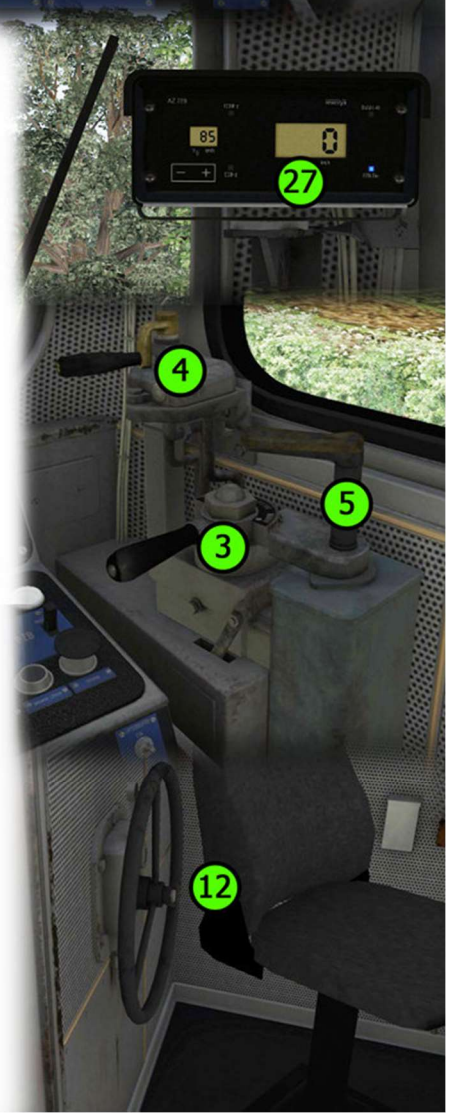
2 DB class 232 Locomotive

DB class 232 traffic red (vR BR232 VRot)*

DB class 232 traffic red Railion Logistics (vR BR232 Railion)*

*Editor naming

3 Cab and Controls



1 - Regulator wheel
2 - Reverser
3 - Train brake lever
4 - Loco brale lever
5 - Dynamic brake lever
6 - Pushbutton „Brake release"
7 - Switch „Drive" on/off
8 - Switch „Dyn. brake" on/off
9 - Switch „Fuel pump" on/off
10 - Pushbutton „Motor start"
11 - Pushbutton „Emergency engine stop"
12 - Handbrake wheel
13 - Pushbutton „Train heating" on/off
14 - Gauge for watertemperature
15 - Gauge for battery
16 - Gauge for motor ampere
17 - Switch SIFA on/off - Gauge SIFA warning
18 - Bushbutton SIFA reset
19 - PZB button trio (Command-Free-Acknowlege)
20 - Pushbutton horn
21 - Switch cabin light on/off
22 - Switch blower control auto/manual
23 - Switch for blowers 1-3 on/off
24 - Switch for headlights
25 - Switch for desk light
26 - Brake gauges
27 - AZ 720 display (Speedometer and PZB lamps)

3.1 Startup and get ready to drive / cold start

Basically the locomotive will be started up so you can start your run with only releasing the train brake and switch "Drive" ("Fahren") to "On" ("Ein").

If the scenario creator called a cold start (see section 5.1), then right after your scenario starts the engine will shut down and your locomotive is not ready to run yet. To start up the locomotive you need to execute the following steps (please note: you may need to push some key commands twice to get them to work (Toggle bug)):

- Switch the fuel pump to on <Shift+K>
- Push the start engine button on the desk <Shift+M>
- Release the handbrake <#>
- Set the train brake to 4,7 BAR <Ö> or <NumPad - >

Now your locomotive is started up. Switch on SIFA <Shift+NumPad Enter> and/or PZB <Ctrl+ NumPad Enter> if you want.

To get the locomotive to run you need a few more steps:

- Release the train brake <Ö> or <NumPad - >
- Check the loco brake and dynamic brake are in released position
- Switch "Drive" to "on" <Shift+W>
- If you want to brake with combined brakes you need to switch on the "dynnamic brake" switch <Shift+S>. The brake levers are then coupled.

Now you can notch up the regulator and do your run.

To shut down the locomotive just switch the fuel pump to "off" and the engine will go down immediately.

3.2 Regulator wheel

The regulator is formed like a car steering wheel and has 16 notches, notch 0 to 15. The BR132 is a diesel-electric locomotive, with the regulator you control the diesel engine speed and with that the power that goes to the traction motors.

Please note: the regulator is disabled / locked when…

- The train brake is or was active
- The dynamic brake is or was active
- The SIFA initiates a brake application
- you initiate an emergency brake application with Backspace or the HUD
- The switch „Drive" is in „off" position
- Overloading of the traction motors has cut the power
- Traction motors maximal ampere overload on about 5900A has happen

- The diesel engine was stopped

To unlock the regulator again move it to notch 0 and eliminate all of the above remarked exceptions. Otherwise you can't apply power.

3.3 Brakes

The locomotive has three brake systems.

- Locomotive brake (straight air brake)
- Train brake (automatic train brake)
- dynamic brake (electrical brake using traction motors)

The **locomotive brake** is only for the locomotive itself and should only be used for light engine movements, and to hold the train when starting on a gradient whilst the auto brake releases, and power builds up sufficiently to start the train moving. Otherwise it should be in the release position.

The **train brake** is a default German Knorr brake. To start driving the brake needs to be completely released. Consider the slow release rates.

The **dynamic brake** is off when you enter the cab. To activate the dynamic brake set switch (8) to position "Ein". The dynamic brake lever is then coupled to the train brake lever if both levers are in the position "Release" and the dynamic brake is switched on. To use the dynamic brake independently move only the dynamic brake lever to uncouple them from the train brake lever.

Please note, that when using the HUD or a gamepad that the dynamic brake cannot be used independently, they can however be used coupled to the train brake lever. Also be aware that if using the HUD, rapid movement of the train brake lever can cause the brakes to uncouple.

Important! When train and dynamic brake are coupled the train brake has a totally different behavior. When braking at higher speeds with the train brake only the dynamic brake is used. When you exceeds the 4.0 BAR brake pipe pressure the train brake will be used too. When driving with slower speeds than 40 km/h the train brake is used in normal operation even if the brakes are coupled. So you have to "play" with the brakes for smooth decelerate.

Button: "Bremse lösen" (force release brakes)
The button „Bremse lösen", to the right of the drivers desk, forces the release of the train brake without moving the train brake lever. This is very useful when you have a SiFa or emergency brake application. Note that it only releases the automatic train brake and not the direct loco brake.

Handbrake:

The handbrake is located on the backwall of the cabin and has to be released before departure. Just turn around the hand wheel or use the key command <#>. If you run with a applied handbrake you will get a power cut soon and the engine falls back to idle RPM.

3.4 Wheelslip and Sander

The class 232 has a special system to prevent the wheels from spinning. An additional pneumatic sanding system that applies sand beneath the loco wheels will help to prevent further wheel-slip. When you hear the nose bearing spinning switch down the power and apply sand to control and prevent further wheel-slip. Also listen to the additional locos in your consist, because they can slip independently.

3.5 SIFA (driver vigilance system)

The class 232 has a SIFA driver vigilance system. When you enter the cab the SIFA is deactivated by default. To switch on the vigilance system, please use the switch (3) which is positioned to the left of the SIFA warning light. Press down the switch and press key <NumPad Enter> to confirm the initial SIFA test alert. The SIFA can only be switched on or off when the locomotive is standing still.

When SIFA is activated and you are driving, you will get a SIFA alert approx. every 30-38 seconds. Acknowledge the alert by pressing key <NumPad Enter>. You have 4 seconds to do so. If you do not respond within 4 seconds you will get a second alert and an additional two seconds to respond. If after this you fail to respond, the SIFA will initiate a normal brake application. To continue driving, acknowledge the alert. The brakes will release automatically. To bring back the traction power you need to set the regulator to zero, to unlock it, and then you can drive further.

3.6 PZB (PZ80R System PZB90)

This locomotive is equipped with a prototypical working PZB. The following key commands are needed for it:

- PZB on or off <Ctrl + NumPad Enter>
- PZB Switch for Train mode <Shift + Ctrl +NumPad Enter>
- PZB Push button to acknowledge <Page down> or <NumPad Enter>
- PZB Push button for PZB Free <End>
- PZB Push button for PZB Command <Del>

The included and simulated PZ80R System PZB90 with its active monitoring curves is nearly working as the real one. Even the behavior after a not allowed releasing from an active monitoring works now as it should. However, we will declare the system as beta version. That's because we can't exclude some failures within its functionality. The system is a full rebuild on some areas to provide the different displaying against the normal DB PZB90. If you found some errors or wrong function, please tell us and use our support channels on our store, mail or Facebook.

We will not and can't provide a full description on the system here, because it will to go beyond the scope of this manual. If you want to learn the generally to use and understand the PZB system, please take a look on this site:
http://www.sh1.org/eisenbahn/rindusi.htm (it's in English)
The different displays to the PZ80R instead of the descripted PZB90/Indusi you can learn easil.

Notice: the build in PZ80R is not exact the same as was available in the class 132 (now class 232) until 1989. It is more the recreated 1990 version from the DB. But the main concept and function is the same.

And at least we build in our PZB help system in this loco, well known from our last EL locomotive, the class 103. This will help you to understand why an emergency brake applying was happened and will tell this with an onscreen message to you. Switch it on wit key <Shift+?>

3.7 Train heating

Acoustically remarkable and an important feature of the class 132 (now 232) was its build in train heating possibility to make it nicely warm for the passenger in the coaches. For that, the diesel engine has to spin up the RPM on about 600RPM to let the generator provide that additional needed electric power to the consist.

We have created this function with an expensive amount of extra development time. Expensive because TS2014 is not able to provide such function and don't like it that much as we do. We build in a separate and virtual working engine RPM to simulate that behavior. Why to notice that here? Because you may confused about some unexpected RPM values in TS2014s HUD.

To switch on or off the train heating you have two push buttons in the cabins desk on the left side. On switching it you get some helpful messages on the right side screen area.

The switched on train heating is in first place an acoustical experience but not only that. In the second place it will affect the traction power within the RPM steps 1-6. You will get a lower tractive effort on that while heating is powered on. To move your train you will and need to set the regulator directly to notch 6 or 7. But beware on the step from 6 to 7 because the traction power comes then rapidly to its normal value. On a heavy train and maybe on a uphill start, you can reach the maximum applicable power to the traction motors get a power cut out as a result. In such cases you need to start a bit slower. In most cases the tractive effort on low RPM is enough to hold the train in place and have a smooth start rolling.

3.8 Cooling blower control

As a little additional feature we build in a manual cooling blower control. Some customers wished that and so we make it. It does not affect the simulation but the acoustical experience.

On the lower part of the cabins desk you will find four switches. From left these are (labeled in German language of course): Lufter Auto/Man", Lufter I, Lufter II and Lufter III. Means: blowers manual on/off and blower control 1 to 3. To switch over from automatic temperature controlled to manual controlled blowers, please set the Lufter auto/man switch to the lower position man.. If the blowers are already running, now they will go off. Please wait for shutting down completely before you set any of them to manual powered on. You can see it on the roof if they are spinning or not precisely. Now you can switch on each blower manually. But note that you need always to switch on blower 1 to get control over blower 2 and 3. If all blowers are spinning and you stop only blower 1, then also blower 2 and 3 will forced to stop. After such procedure you need to switch all blower switches to off and wait for their spin off. After this you can switch them on again if you want.

To inform you about the simulated blowers in function and sound we will tell you, that the blowers on that loco called as "Siemens" ones. This means that these are newer blowers from Siemens instead of the original delivered ones on the DR class 132s. They are much quieter than the original ones. The used sounds for the blower are captured from a class 130 but their noises are nearly the same, just a lot quieter. We tried to rebuild that sound as good as we can do it in TS2014 and you can hear a distinct difference to the class 132.

3.9 Additional keycommands and cab controls

<V>	Wipers	<NumPad ;/´>	Train brake
<L>	Cabin light	<Shift+W>	Drive on/off
<Shift+L>	Desk light	<Shift+S>	Dynamic brake on/off
<Space>	Horn	<Shift+M>	Motor start
<X>	Sander	<Shift+K>	Fuel pump
<Ctrl + NumPad Enter>	PZB on/off	„Bremse lösen"	Release train brake
<Ctrl+Shift+ NumPad Enter>	PZB train mode	„Lüfter Auto/Man"	Manual blower control
<Shift+ NumPad Enter>	SIFA on/off	„Lüfter" „I"-„III"	Blower I-III on/off
<NumPad Enter>	SIFA reset	„Zugheizung"	Train heating on/off
<Page Down>	PZB Acknowledge	<NumPad Enter>	PZB Acknowledge
<End>	PZB Free	<Shift+[>	PZB Help system on/off
<Del>	PZB Command	<Shift+Home>	Headlight beam stronger
		<Shift+End>	Headlight beam lesser

4 Additional notes

4.1 Notes for scenario creators

AI:

Basically it is easy to set up the class 232 for AI use. But please let them a few seconds before starting their runs. If not it can happen that they driving without exhausts smoking.

Since TS2014 is not that gently to AI driven diesel locomotives, please spend an extra bulk cargo weight to the connected wagons of about 200-400 tons. Especially if you build light weight passenger consists. They look a lot better if you put on that extra cargo. You can do that with most of our rolling stock out on our store.

Player:

For the player driven train you need to consider the following. Class 232 locomotives are not able to push consists with a driving trailer or get used as a multiple traction. Unfortunately TS2014 is not able to do that in a right way. If you want that the player drives in multiple traction, please let them know to not change the active driven loco if possible. There is a chance that the brake operation will not work further as expected. Multiple traction on AI driven consist is no problem at all.

Please give your player a minimum of one minute to start up the locomotive before departure. The startup procedure has to proceed by the player.

Cold start:
This locomotive has the ability to stay shut down on scenario start. The player then needs to start up the engine before he can start the run. To call a cold start, you

need to enter a "c" before the engine number into the editor fly out field. So for an engine numbered as "2321313" (232 131-3 on the model) you need to enter "c2321313" into that field.

5 Thanks

Now enjoy driving that "Beast" and have thanks for your confidence.

Best regards
Your virtualRailroads team

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Maik Goltz