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Our Insider Model For 2002 Of The Class 45 Steam Locomotive Giant

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More Tractive Effort For Freight Service

The prestigious express passenger service predominated in the heyday of the German State Railroad Company. Modern SVT Powered rail cars and streamlined steam locomotives vied for records. Freight traffic was also increasing rapidly, if not exactly in the limelight. Freight train tonnage was on the rise and locomotives were increasingly bumping up against the limits of their abilities. Time consuming and expensive doubleheading of locomotives was instituted to get heavy freight trains over routes with grades. For these reasons the DRG established specifications for a new freight locomotive. It had to be capable of hauling the heaviest trains on schedule at a speed of 80 km/h or 50 mph on level ground and without helper engines on grades. Required characteristics of this locomotive were calculated at an axle load of 20 metric tons, a larger boiler with 294 pounds per square inch of pressure and about 2,800 horsepower. A total requirement of 130 locomotives was forecasted. The locomotive building industry was requested to have designs ready within a month.

In the meantime there were intense discussions behind the scenes. Various offices, departmental sections and departments of the DRG's central management as well as the locomotive recommendation committee were involved in the decision to procure steam locomotives. With so many officials and experts different opinions bounced off of one another, especially where it was a question of the concept and effectiveness of more powerful steam locomotives. Drawing support from the different lines of development in the locomotive building industry, one faction advocated larger firebox heating surfaces, another wanted a boiler with longer flues.

The locomotive committee had only two months time to argue about the suggestions that had been put forth. In a two-day meeting a decision was made about the project. The faction in favor of long flues in the boiler prevailed, and at the same time the design of parallel parts was planned with the class 06 express locomotive that was developed alongside this locomotive. The class 45 was ordered, because the DRG's central management usually went along with the decision of the locomotive committee.

Two prototype locomotives were first built and underwent basic test runs starting in 1937. These two units reached an average daily run of up to 460 km or about 288 miles with train loads of over 1,200 metric tons. The class 45's tractive effort surpassed that of the class 44 by 25 percent. The high expectations for performance appeared to have been confirmed in the process: The class was and will remain for all time the largest, most powerful and fastest German freight steam locomotive.



Photo right: This Henschel factory photo from 1937 shows the first class 45 before it was given its final paint job.

Below left: The immense boiler for the 4,5 001 is ready for installation (Henschel factory photograph, EK-Verlag Collection).

Lower photo: The front view gives an impression of the mighty dimensions of this class (Henschel factory photograph, Mario Brutschin Collection).



The Largest, The Most Powerful, The Fastest

The class 45's high level of performance impressed people. It accelerated the average speed for freight trains and rendered the use of helper engines in many cases unnecessary. Thanks to its maximum speed of 90 km/h or 56 mph it was used as a substitute for the 01 in express passenger service on Mittelgebirg routes.

For firemen working on the class 45 was as difficult as it could be. Originally, automatic coal stokers were planned for this loco-motive, but they fell victim to the accountant's red pencil. Instead, two firemen were planned for service on a class 45 locomotive, but because even these plans were usually cancelled, the class 45 emerged to the horror of all of the DRG's firemen. The 289 square meter or approximately 3,110 square foot heating surface required good conditions for shoveling coal in order to keep the immense boiler under steam.

Boiler flaws began to appear as early as the intermediate improvement work done on the preproduction locomotives. The steel used for the boiler had given excellent results on other classes of locomotives, but was unsuitable for a boiler of these dimensions. The boiler pressure was decreased as a countermeasure, which decreased the level of efficiency. Since freight locomotives of similar power but less susceptible to boiler flaws were available in the class 44, the quantity of regular production class 45 units was reduced. In addition, the need for faster, lighter freight locomotives for main and branch lines was pushed to the forefront. A total of 28 units of the class 4.5 were built.

After World War II the DB acquired ownership of only a few of these locomotives. Several were equipped with new fireboxes with combustion chambers and stokers for mechanical delivery of coal to the combustion chamber. Different railroad test departments used the class 45 as braking and experimental locomotives due to its high power and speed. Our prototype no. 45 020 also survived past 19.5.5. It remained unchanged from when it was delivered and was retired in 1968 as the last of the class 45.

The Most Important Features of the Class 45

Basic Data

<i>Total length of the locomotive and tender in.</i>	25,645 mm / 84 ft. 1-5/8
<i>Weight empty</i>	117.35 metric tons
<i>Service weight</i>	128.14 metric tons
<i>Maximum continuous power at the drawbar</i>	2,290 horsepower
<i>Maximum speed</i>	90 km/h / ,56 mph

Boiler and Firebox

<i>Operating pressure in the boiler</i>	20 atmospheres or 294 lb. Per sq. in.
<i>Water capacity for the boiler</i>	10.3 cubic meters / 2,721 gallons
<i>Maximum internal diameter</i>	2,000 mm / 78-3/4 in.
<i>Length of the flues</i>	7,500 mm / 24 ft. 7-1/4 in.
<i>Grate area</i>	5.04 sq. meters / 54.23 sq. ft.
<i>Evaporative heating surface</i>	289.0 sq. meters / 3,109.64 sq. ft.
<i>Total heating surface</i>	421.5 sq. meters / 4,535.34 sq. ft.

Frame and Running Gear

<i>Sidewall thickness of the underframe</i>	100 mm / 4 in.
<i>Wheelbase</i>	5,550 mm / 18 ft. 2-1/2 in.
<i>Driving wheel diameter</i>	1,600 mm / 63 in.
<i>Cylinder diameter</i>	3 x 520 mm / 3 x 20-1/2 in.
<i>Piston stroke</i>	720 mm / 28-3/8 in.

Tender

<i>Water capacity</i>	38 cubic meters / 10,040 gal.
<i>Coal capacity</i>	10 metric tons
<i>Service weight for the tender</i>	81.2 metric tons
<i>Average axle load when filled with coal and water</i>	16.3 metric tons

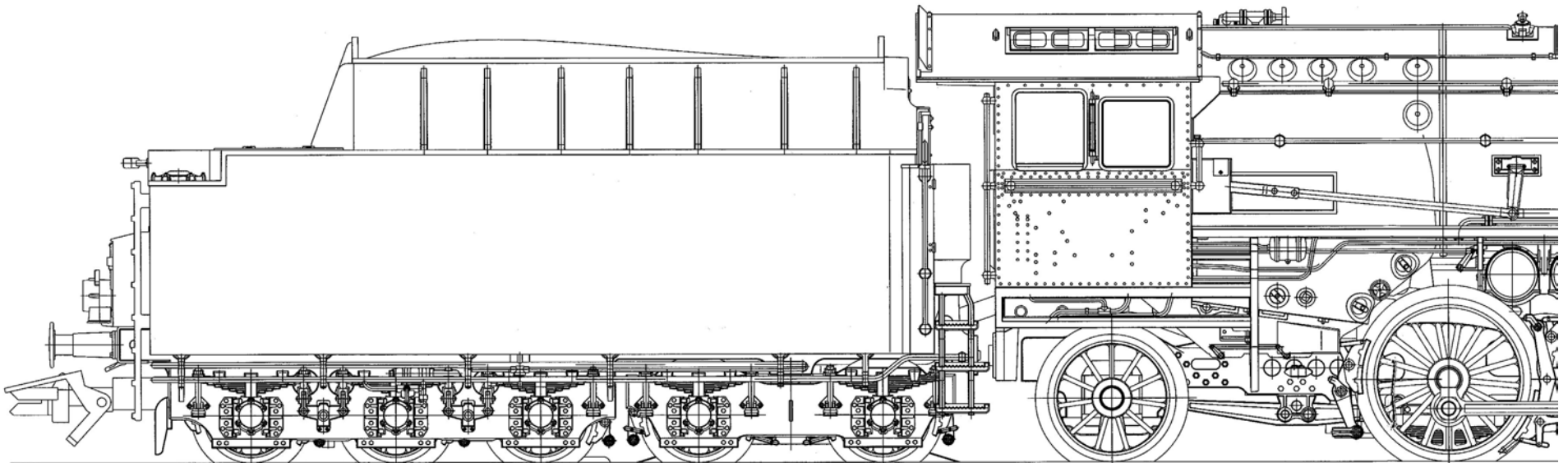
The photograph shows a class 45 in use as a braking and experimental locomotive., here in 1950 during tests with a calss 52 new construction locomotive. (photograph from Carl Bellingroth, EK-Verlag Colleciton).



Powerful Prototype, Marvelous Model

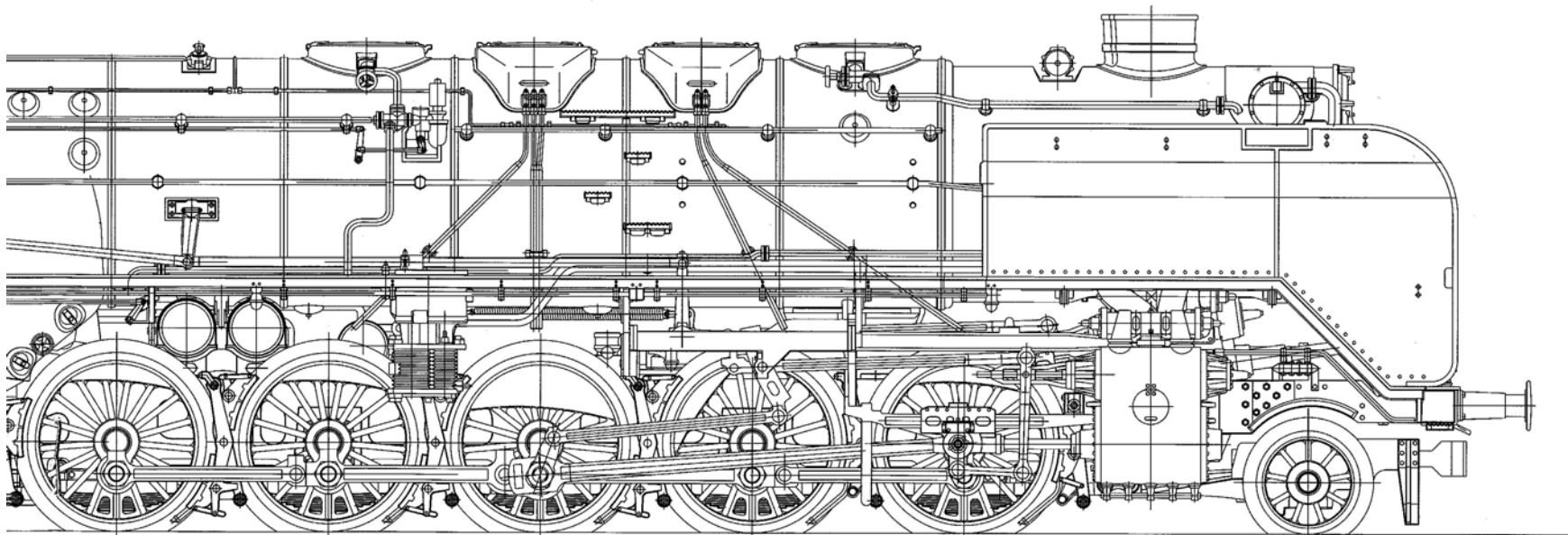
We model railroaders don't need to worry about the problems with the prototype. As the largest, most powerful and fastest German freight locomotive it was used at the point of the heaviest freight trains on flat terrain and on the Mittelgebirg routes as well as for express trains and later as a braking locomotive for testing purposes. It is therefore suitable as a model for all sorts of uses on a layout.

The exact, scale translation from the prototype into the model shows that our model of the class 45 is the largest German freight steam locomotive model in H0. This outstanding unit measures exactly 295 mm or 11-5/8" over the buffers. Less visible - but typically Märklin - is the method of construction: The frame, boiler and tender of this heavy model are made of high-quality vacuum-diecast zinc. This is a process that allows us to produce the finest of detailing. The greater authenticity of metal construction is clear; with this might, heavy model of the class 45 the metal construction is even more impressive in its effect.



Numerous separately applied details such as grab irons and piping complete the model. Because the prototype was so famous as a triple cylinder locomotive, we have also reproduced the inboard mounted cylinder, but with no working parts, because you couldn't see it anyway during operation. The engineer's cab is also reproduced with all of its essential fittings and details.

Another striking feature is the close coupling with a guide mechanism between the locomotive and tender. The fireman's job is difficult enough as it is, and here he no longer has to take his life in his hands jumping back and forth. The spacing between the locomotive and tender is prototypically close. This also applies to the spacing between the tender and freight cars that couple buffer-to-buffer with the tender's coupler. The front coupler is mounted together with the pilot truck with a guide mechanism. The coupler pockets correspond to the NEVI standard.



Technical Data For The Heart And For Comprehension

We have already spoken about the attractive qualities of metal construction; this model's inner features have the same high level of value:

A can motor with a bell-shaped armature is used for propulsion. Experts know that this motor principle delivers silky smooth running characteristics with a fine degree of control and low operating noise. The motor is built into the boiler in the area of the firebox. At the same time it conceals the gear drive that powers the locomotive's fourth axle directly. Traction tires on the second and fourth axles increase the pulling power. The three remaining axles are spring mounted, which improves the resistance to derailing and the electrical contact with the track. The driving axles have side play to enable the locomotive's long frame to negotiate curves. A combination of powered axles and side rods ensures that all of the driving axles are powered as with the prototype.

The running qualities for this propulsion system hold true for all modes of operation and for both versions of our model:

The Delta version can be run with conventional AC power or in Digital operation. The headlights are on all of the time and change over with the direction of travel. The 7226 smoke generator can be installed in the locomotive for conventional operation. The Seuthe no. 11 smoke generator is recommended for Delta/Digital operation. The smoke generator is also on constantly when the locomotive is in operation.

On the digital version a digital decoder control the locomotive's propulsion and auxiliary functions. It controls the can motor with a bell-shaped armature by means of adjustable running characteristics. Acceleration and braking delay can be set to simulate the running of the prototype. The motor's rpm can be controlled according to the load so that the locomotive maintains a nearly constant speed on ascending and descending grades.

A sound effects circuit produces a very realistic sounding steam locomotive noise. This sound effect varies with the speed of the locomotive and is synchronized with the rpm of the driving wheels. The glowing light from the firebox is synchronized to change with the tempo of the locomotive's exhaust stroke. A light-emitting diode produces the warm reddish flickering light. A whistle sound can be activated by means of a function button as a warning sound.

The headlights and the firebox light as well as the smoke generator are on constantly in conventional operation. In Digital operation all of the light, smoke and sound functions as well as the acceleration and braking delay can be turned on and off with the 6021 Control Unit. A steam whistle sound can also be turned on and off with a function button.

Another visual and technical treat could not be shown in the photograph of the model, but it will show up in the regular production model: The newly developed headlight lanterns are considerably finer in dimensions and the light lenses are separately applied.

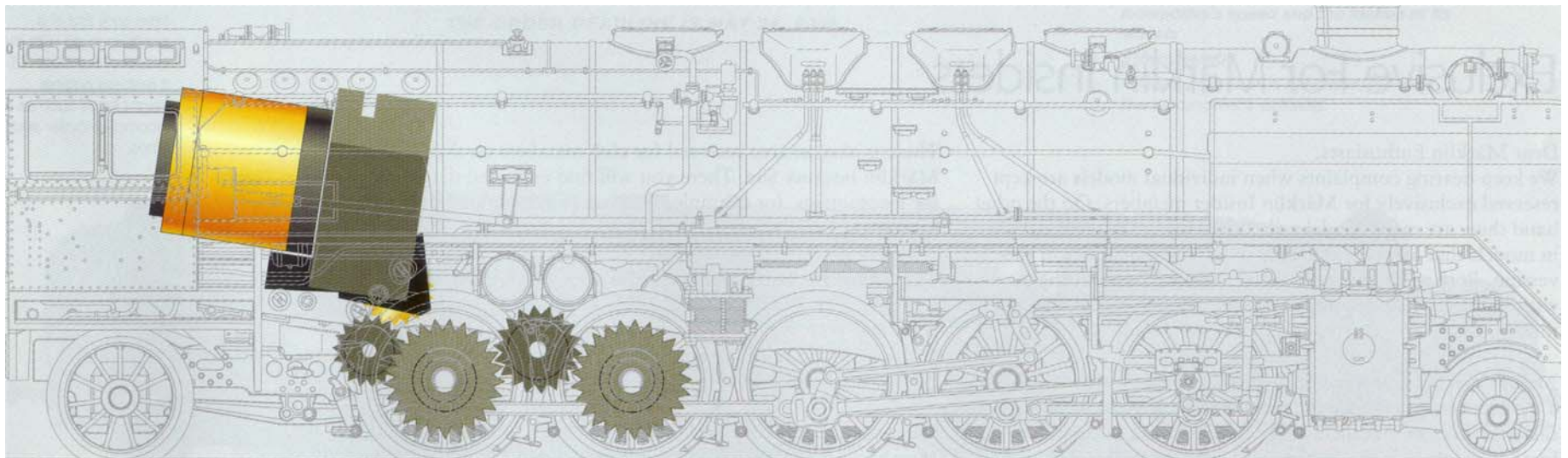


◀◀◀ *Pure steam locomotive romanticism: The red light of the glowing coal in the firebox flickers in time with the locomotive's exhaust stroke.*

◀◀ *The perfect illusion: Smoke generators for conventional or digital operation can be retrofitted into the locomotive.*

◀ *Realistic detailing: Fine headlight lanterns and razor sharp lettering such as the builder's plate on the cylinder underscore the prototypical realism. Even the inboard mounted cylinder is reproduced.*

▼ *A clever propulsion concept: Hidden by the boiler and firebox, a can motor with a bell-shaped armature and a worm gear drive the fourth driving axle through three intermediate spur gears. The remaining driving axles are powered by means of side rods. The necessary side play for negotiating curves is thereby ensured as is the open view between the frame and the boiler.*





Exclusive For Märklin Insiders

Dear Märklin Enthusiasts,
We keep hearing complaints when individual models are kept reserved exclusively for Märklin Insider members. On the other hand there are many model railroaders who take great delight in models that are available only in a limited quantity in this version. Both reactions show us whether we have hit the mark with the Insider model, and so we are also expecting mail about this model.

Anyone can become a member of the Märklin Insider Club. For a modest annual club fee the members receive an extensive range of services that include the Insider News (6 times a year). In addition there is the Mini-Club Letter (in the Insider News) and exclusive annual cars in Z or HO - all of this up-to-date.

There is also an area reserved for club members on the German Märklin Internet Site. There you will find exploded diagrams for locomotives, for example, that you can download. It's worth having a membership.

The annual exclusive models for Insiders are therefore two things:

A reward your loyalty to our brand and for us confirmation whether we are fulfilling the wishes and expectations of demanding model railroaders.

We cordially invite you to become a member of the Insider Club. Membership application forms for the English language Insider Club can be found at www.marklin.com.

A five-car freight car set from early Era 111 is available to go with the model of our class 45. It features original freight loads such as a locomotive boiler and pipes. (#48801)



34450 Heavy Freight Locomotive with Tender

Prototype: German Federal Railroad (DB) class 45.
Version with older design boiler

Model: Comes with DELTA electronic circuit. High-efficiency can motor with a bell-shaped armature. 5 axles powered. 4 traction tires. Metal tender. Close coupling between locomotive and tender. Reproduction of the inner cylinder. Numerous separately applied pipes and grab irons. Ready for installation of 7226 smoke generator (conventional operation) or Seuthe no. 11 (DELTA/Digital operation). Length over buffers 29.5 cm / 11-5/8".



37450 Heavy Freight Locomotive with Tender.

Same as 34450, but with a digital decoder, controlled high-efficiency propulsion with can motor with a bell-shaped armature, sound effects generator and firebox light glow. Ready for installation of 7226 smoke generator. Headlights, smoke generator that can be retrofitted into the locomotive, and the firebox glow that is synchronized with the exhaust of the locomotive will work in conventional operation and can be controlled digitally. **Steam locomotive sound effects that are synchronized with the motion of the locomotive and that are dependent on its speed, whistle sound as well as acceleration and braking delay can be controlled digitally with the 6021 Control Unit.** Length over buffers 29.5 cm / 11-5/8".

The 34450 and 37450 freight locomotives are being produced in a one-time series for Insider members. Delivery is planned for the end of 2002. The number of models produced will be determined by the number of orders received from Insider members.

THE ORDER DEADLINE IS MAY 24, 2002.

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- ▶ **Metal frame, boiler and tender**
- ▶ **Headlights have maintenance-free LEDs**
- ▶ **Close coupling between locomotive and tender**
- ▶ **High-efficiency motor with a bell-shaped armature**
- ▶ **Reproduction of the inner cylinder**

On the Digital model:

- ▶ **High-efficiency propulsion with monitoring features and adjustable running characteristics**
- ▶ **Sound effects synchronized with the locomotive's speed and the motion of its wheels**
- ▶ **Steam whistle**
- ▶ **Firebox glow that is synchronized with the locomotive's exhaust**

