Class HG 4/4 almost good to go

The high-end class HG 4/4 cogwheel steam loco has reached the final phase of development. Märklin audio specialists were sent to track down the authentic sound of the class HG 4/4. Meanwhile, a working model of the high-end loco was unveiled for the first time at the IMA in Göppingen.

Every loco sounds different. This railroading adage applies all the more to Europe's most powerful cogwheel steam loco. Equipped with two low-pressure cylinders for rack rail operation as well as two high-pressure cylinders for adhesion operation, the class HG 4/4 steam loco of the Furka Mountain Line Steam Railroad (DFB) has a unique sound of its own – a sound that LGB definitely wants to incorporate into its new top model. The class HG 4/4 by LGB will sound like the prototype and not like many other steam locomotives. To this end, two audio specialists from Märklin traveled with their extensive recording setup to Realp in the Swiss canton of Uri. Their mission? To capture all the important operating sounds of the class HG 4/4. On Friday September 13, just before nine o'clock, the two audio specialists started work at the DFB depot workshop in Realp. The locomotive engineer and fireman of the DFB 704 had lubricated the loco and brought the boiler up to operating temperature. As the loco took on supplies of coal and water, the recording team from Göppingen was already up and running. While one sound technician with a directional microphone, microphone boom and a flash recorder pinpointed the primary sound sources, his colleague documented the overall sound of the operating loco using a hand-held recorder. The short journey between the depot, water crane and coaling plant gave the technicians an op-

portunity to make some initial recordings inside the engineer's cab. This marked the start of a large number of other sound recordings that they wanted to make on the journey from Realp to Oberwald. The picturesque mountain route offered plenty of opportunities to record the entire sound repertoire of Europe's most powerful cogwheel steam loco. It included sections with gentle and steep uphill and downhill gradients, slow and fast speeds, forward and reverse running, entrances and exits

Running gear sound: The two sound technicians tracking down the unique sound of the cogwheel mechanism.

from train stations and lots more besides. Running sounds were recorded during operation on normal tracks as well as during rack rail operation, when the loco is powered by all four cylinders together, which creates the striking acoustic effect of eight exhaust strokes per wheel rotation. The audio specialists also installed two microphones inside the engineer's cab on the loco to make recordings during the journey. Three additional microphones were also set up on the platform of the first ▶

PHOTOS: TILL PUETZ; LGB, ARNULF SCHÄFER ; TEXT: ARNULF SCHÄFER

Intermediate stop: The process of taking on water was included in the extensive library of sounds recorded in CD quality.

car directly behind the loco. From that position, they were able to record selected additional sounds heard during the journey in the engineer's cab and at the sides of the loco. Sounds such as the opening and closing of the firebox door, the shoveling of coal or the cranking of the controls were recorded as were the whirring of the generator, sounds of the injector and many more – including the chuffing sounds of the class HG 4/4 along the route. The Märklin technicians even made sound recordings when the loco stopped to take on water.

After capturing five gigabytes of sound data at CD quality during the trip through the wonderful scenery along the Furka Mountain Line Steam Railroad, the sound team headed back to Göppingen. Additional steps have yet to be completed and they involve sorting and allocating the sounds, removing background noise from the audio clips, selecting the recordings, processing the sound all the way to customizing the sound samples. It's a lot of work but definitely worthwhile in order to make the sound of LGB's new high-end model as unique as the prototype.

While the two specialists were busy gathering sound recordings, some 217-31/64 miles (350 kilometers) further north, LGB was officially announcing the class HG 4/4 cogwheel steam loco as a new item for fall 2019 at the IMA and at the Märklin Days 2019 in the event tent in front of the Werfthalle in Göppingen. The finely detailed LGB steam loco model with heavy metal construction will be available in spring 2020 as a high-end model in two versions. Alongside the green and black version from era VI (item 26270), as it currently operates on the Furka Mountain Line Steam Railroad as DFB 704, there will be a version of the class HG 4/4 bearing road number 701 (item 26271), which replicates its appearance in era II, when it was delivered by the manufacturer SLM Winterthur (Swiss Locomotive and Machinery Company Winterthur). Production of the two high-end steam locomotives is restricted to 399 pieces

Listening in: Two microphones in the loco and another three behind it captured every sound of the class HG 4/4.

Taking a quick breather: The sound team shortly before starting work on the car platform directly behind the class HG 4/4.

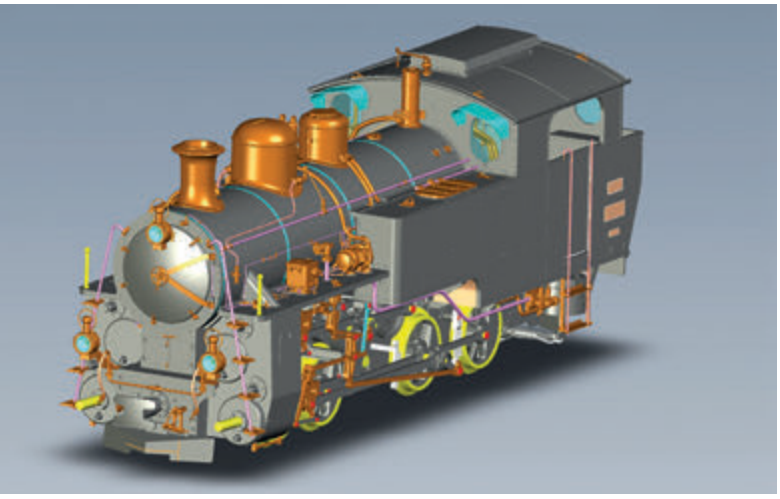
Debut performance: The working model of the class HG 4/4 made an appearance at the IMA and the Märklin Days 2019 in the EWS Arena.

Star of the show: The class HG 4/4 at the LGB stand became a major attraction.

worldwide. During the IMA and Märklin Days 2019, a working model of the class HG 4/4 at the LGB stand in the EWS Arena attracted a great deal of attention from visitors. Over the three-day event, the loco continuously and successfully ran along a section of rack rail with an eight percent gradient on a cog railroad diorama. Although this working model still featured a 3D-printed boiler and cab and brass parts that were not fully detailed, the drive unit containing the high-performance motor that powers all driving wheel sets by means of side rods and enables genuine cogwheel mode was already in an advanced stage of development. Consequently, visitors to the exhibition could observe at close quarters the interaction of the superimposed running gear systems. In cogwheel mode - both on the prototype and the LGB model of the class HG 4/4 - the adhesion running gear and the cogwheel mechanism operate simultaneously. However, the cogwheel mechanism runs at twice the rpm and in the opposite direction of rotation to the adhesion running gear. It is a sight that captivates every onlooker.

On the production model, the parts shown in white on the working model, along all the entire running gear, will be made from high-quality and durable zinc die-castings. This is the only way to guarantee the required accuracy of the parts and to ensure that the loco's high pulling power is reliably transferred to the rails. Particularly in cogwheel mode, the class HG 4/4 generates enormous forces. Incidentally, the class HG 4/4 automatically switches between normal and rack rail operation. A sensor detects whether the track is fitted with rack rails and then switches the loco to cogwheel mode. Like the prototype, cogwheel mode can be activated in digital operation but also when the loco is stationary. This means that cogwheel mode can also be activated, for instance, on the roller test stand, when the loco is stationary or on layouts not fitted with rack rails. ▶

Long-distance runners: The working model of the class HG 4/4 ran continuously for three days on this mountain section with an eight percent gradient.



A wonderful LGB model: The design of the HG 4/4 has long since been finished and the beautiful model can already be ordered. Matching cars will follow.

NUMEROUS PROTOTYPICAL DETAILS

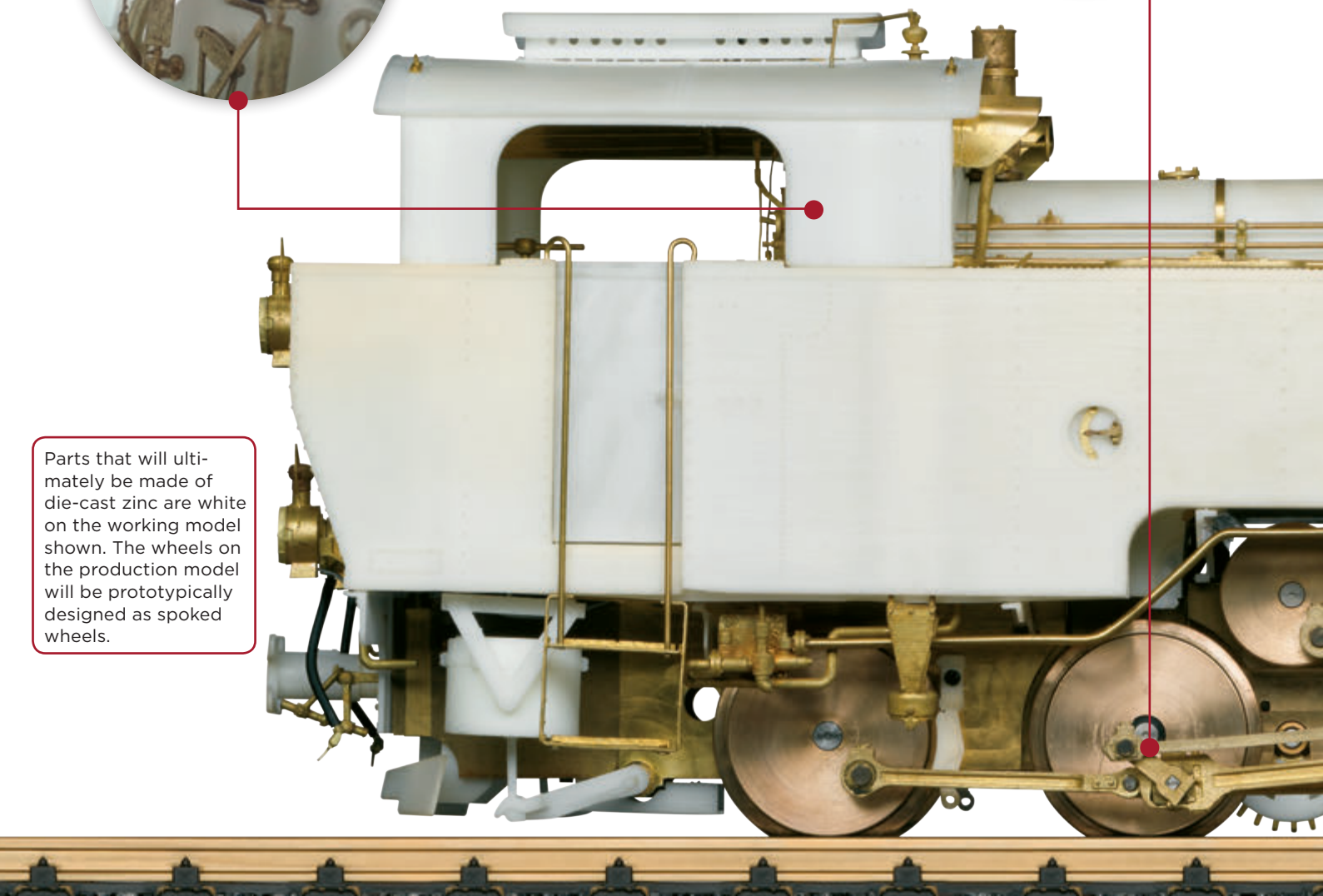
The class HG 4/4 cogwheel steam loco, era VI, item 26270

1. Automatic activation of cogwheel mode when the loco runs on rack rails.
2. Internal running gear can be digitally controlled, for example, on the roller test stand.
3. Different operating sounds for cogwheel mode and adhesion mode.
4. Cogwheel mechanism turns at double the rpm in the opposite direction to the adhesion running gear.
5. Prototypical operating sounds.
6. Minimum radius R1 (600 mm), rack rail operation possible on wider radii.

Class HG 4/4 cogwheel steam loco

Highly detailed: The rear wall of the vertical boiler in the engineer's cab

Wheels in sync: The rodding on the driving wheel



Parts that will ultimately be made of die-cast zinc are white on the working model shown. The wheels on the production model will be prototypically designed as spoked wheels.

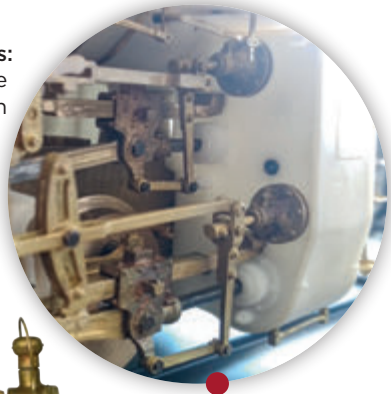
Further details were released at the presentation of the class HG 4/4. The new cogwheel steam loco will be the first quadruple smoke generator from Märklin. Along with steam exhaust sounds from the smokestack and cylinder steam sounds that are synchronized with the wheels, the new LGB feature adds steam exhaust via the whistle and the vacuum brake. We can also reveal information about the running characteristics of the 15-3/4-inch (40 cm) steam loco: The cogwheel steam loco can run on tight R1 radii (radius: 23-5/8 inches (600 mm)) in adhesion operation. In other words, it can operate on tight curves and on all LGB turnouts. When running in genuine cogwheel mode, however, the loco's minimum radius is slightly greater for technical reasons. Details regarding the scope of delivery of the new high-end loco have also been leaked. The loco will be delivered with the flags of Switzerland, France and Vietnam. The little flags can be fitted to the buffers of the loco – as they were for the prototype's maiden journey on June 25, 2019 after a restoration period lasting more than twelve years for this wonderful 'new' old cogwheel steam loco.

HIGHLIGHTS

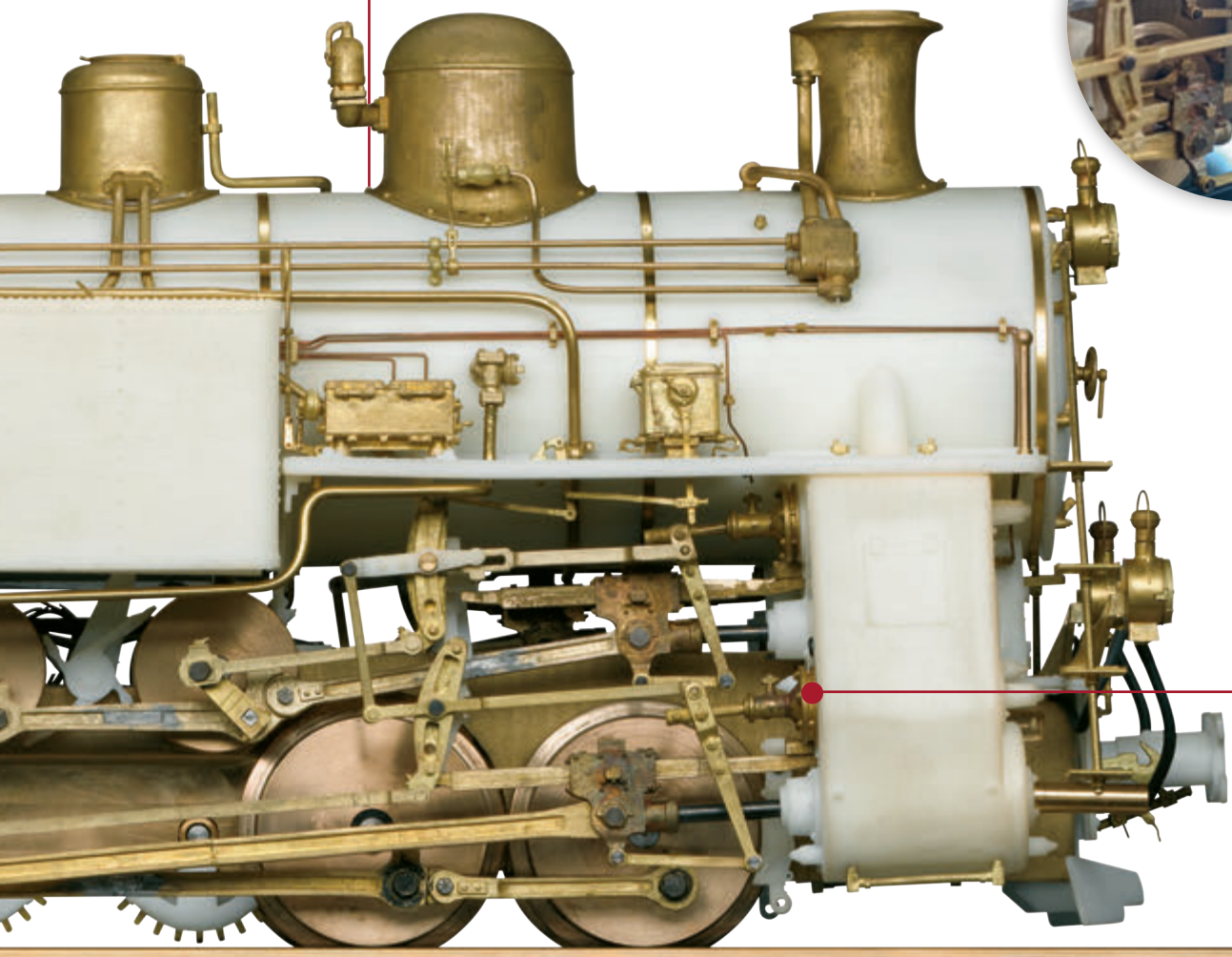
The class HG 4/4 cogwheel steam loco, era VI, item 26270

1. Running gear, boiler and engineer's cab of premium zinc die-casting featuring consistently high production quality. Rugged construction with high precision in the drive and outstanding pulling power on the rails.
2. Finely detailed model with heavy metal construction. The delicate separately applied parts of brass are extremely realistic.
3. Fully functional cogwheel mechanism with powerful DC motor.
4. mfx/DCC digital decoder with many sound and light functions, such as running sounds and station announcements as well as headlight, firebox and engineer's cab lighting.
5. Smoke generator with steam exhaust from the smokestack synchronized with the wheels, as well as cylinder steam, steam exhaust at the whistle and vacuum brake. The first quadruple smoke generator from Märklin.
6. Running sounds are also functional in analog operation.

Highly accurate: The feed valve and generator



Sure-footed on curves: In adhesion mode, the class HG 4/4 can even run on tight R1 radii



HIGHEND