

Der GARTENBAHN *profi*

1 / 2006

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INTERNATIONALES MAGAZIN FÜR GROSSE MODELLBAHNEN

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The RhB G 4/5 from BRAWA

Crème de la crème Page ..

Nothing on the new RhB G4/5 Express engine would give any indication that it is BRAWA's first Large Scale product - that's how good the first impression is! If everything lives up to the impression and what needs to be considered for everyday use of this very finely detailed engine, you'll find in the test.

Despite the large following the RhB enjoys among large scalers around the globe, steam engines have so far been the wallflowers in the lineup. Only Kiss and Magnus have thus far catered to the RhB steam fan with small series, high ticket items. But this is the year when two of the large manufacturers pull even: LGB announced the G 3/4 "Heidi" and plans to have the engine in the stores by December. BRAWA, a newcomer to the large scale scene, has just delivered the G 4/5.

After our first encounter with one of the pre-production models of the G 4/5 in August (GBp 5/05), we now had a production model (#793) for extensive tests at our disposal. After all it isn't just about showcasing an engine, but rather also a matter of how BRAWA interprets their perception of 1:22.5 scale (IIm).

Yellow joins Red

The Large Scale departments in the stores had so far a preponderance of red

boxes, but mixed in will now be the yellow of the BRAWA packaging. The engine and the tender are packed in separate cavities of the styrofoam inserted in the long cardboard box. Thanks to the wide metal running boards the heavy engine (4.2kg/9.2lbs) is easy to lift but one needs to lift on the running boards and pay some attention not to catch the delicate steps in the process. The same lifting procedure makes setting the engine on the track - the first driven axle pivots in the vertical and the following two can be off-set to the side - much easier.

Included are three drawbars of different lengths to adjust the engine tender spacing. The shortest one measures 33mm and is intended for display case use. The user needs to decide - depending on the minimum radius on the layout - which drawbar to use, since there is no easy adjustment.

Radii between 600mm and 120mm (R1 and R3) will, according to the manufacturer, require the long 70mm draw bar. However, on properly laid track LGB's R2 can be negotiated with the medium 60mm draw bar - a much more pleasing distance between the engine and tender. Negotiating R1 or three way turnouts with the medium draw bar is not possible. Attempts at smaller radii than conforming to the corresponding draw bar results in the tender levering the last driver set off the rails.

Apart from the drawbars there are a few extras: 24 fabric bags filled with plastic

granulate to simulate the coal. A few fireman's tools, a foot plate between the engine and the tender - use is only recommended for the display case.

In addition the G 4/5 sports protection tubes for the cylinder rods, to be used if the minimum radius on the layout is larger than 1200mm - just slightly more than R3. In this case it is again recommended to test all parts of the layout, including turnouts etc., to assure the leading axle does not interfere with the tubes when going through curves. In a worse case the leading axle will dislodge the tubes together with the cylinder cover - but that is easily reinstal- led.

Tips and hints in this respect are unfortunately missing from the manual, which otherwise is quite detailed - especially for the digital version of the engine. The technical information is otherwise detailed and includes references to the spare parts in the exploded view drawings. All the important CV values of the decoder are mentioned - however the instructions for the basic engine are generally too sparse. A few sentences on how to dismantle and assemble the engine have to do - but perhaps it is good not to provide too many hints and tips, since dismantling the engine is only for the experienced. A relatively simple procedure provides access to the tender which contains the electronics; remove the four screws in the floor of the tender. If the body won't budge exert careful pressure on the screws after

loosening them 3 or 4 turns - always on a pair of screws.

Smoke box with content

The fingers can get busy at the front of the engine: The centre buffer is sprung and the smoke box door can be opened. Instead of the many tubes in a smoke box one finds a printed circuit board with the adjustment switches for the sound volume as well as the selector for 2 or 4 exhaust chuffs per revolution of the wheels. The two chuffs actually sound better - must be the inability to scale down sound. As convincing as the Dietz sound module is, the sound of coal being shovelled - complete with flickering flames in the firebox - would have a better effect if it were coming from the vicinity of the firebox instead of the cylinders, alas the motor is in the way.

Coupling tender to engine and connecting the 18 conductor cable is definitely easier for slender fingers with dexterity, more so if the short draw bar is installed - one will happily leave the two connected.

We didn't omit LGB's R1 radius during our tests. An absolute must was installing the longest draw bar. This results in an additional 37mm (1.45") gap. Since BRAWA decided on a fixed frame with the ability to negotiate the tight R1 by using an improved wheel profile and the inner axles lateral displacement, the axles will not align in a radial sense to the track axis. When the engine is operated in analogue mode this results in a noticeably reduced top speed, along with a reduction of pulling power when compared to tangent track. However the G 4/5 has sufficient power to negotiate the R1 or an equivalent arrangement of turnouts (the radius on those is slightly smaller!) with the four cars in tow. The corresponding wear during this exercise will happen on the brass track rather than the nickel plated wheels.

The shortest draw bar is, as mentioned, intended for display. Only with this arrangement will the total length over buffers correspond to the prototype dimensions. But apart from that this is an exact 1:22.5 replica of the prototype, the deviations are within tenths of a millimeter. The only compromise BRAWA made - on account of functional engineering is the diameter of the leading axle wheels (29mm instead of 31mm) and

the centre distance between the leading axle and the first driven axle (93.5mm instead of 91mm). All other dimensions are faithful and correct 1:22.5 values. The detail on engine and tender look very nice - including fine hand wheels, piping and brake hoses. However when the engine isn't on a track one can move the second and third axle far enough laterally that the flanges of the second axle will break off the sander piping of the first axle, a more flexible material would be better. This can't happen with the engine on the track since the extreme positions of the axles are then not reached. The external metal valve gear of the engine can easily cope with the displacement. BRAWA sets new standards in the mass-produced category by not only replicating the complete valve gear, but doing it to scale, with the proper relief and even the finish shows a slightly brownish tint and sheen - as if freshly lubricated, but much cleaner. The reversing lever can be manually moved - it doesn't have a function - to the proper position for forward or reverse. This should be a delight for the collectors who like to display the engine - the operators can leave it at mid-travel, the position most often seen on mass-produced models.

The drive assembly includes a motor with a flywheel. The fourth driving axle is powered through a gear box and the first one connected via a universal drive shaft. Axles 2 and 3 get powered via the side rods. Those two sprung axles have a lateral displacement of approx. 7.5mm (0.3"), the first driving axle pivots in a vertical manner - the result is a three point equalizing system which provides good power pick up and prevents derailments. And: It allows negotiation of the 600mm R1, if it is really required, without the articulated frame method in so many instances used by LGB. The view of the engine on R1 isn't a pretty one, since the overhang in front and back (we measured a maximum of 78mm (3.07") when entering the R1, once the engine was completely in the curve this was reduced to 70mm (2.75")) as well as the displacement of the centre towards the inside of the curve comes very close to the catenary masts.

A model, not a toy

Even if many of the added details are very elastic: if it has much finer detail, it deserves more careful handling. More so since BRAWA calls it a model steam engine, not a railway toy. Despite this, given proper care, the G 4/5 has no handicap on the garden layout. The sprung axles together with the pivoting axle result in a three-point equalizer with very good "sure footedness" - no one with reasonably good track which is free of debris needs to fear derailments. Nonetheless: While we tested this and that off the track we broke off a sander - it is nice to know that BRAWA will offer all the add-on parts as spares - not least to match the established LGB Service.

BRAWA didn't just consider the esthetics, the practical is just as important. For example the bottom of the frame, between boiler and cab, features a removable plate to mount a trigger magnet. Details like that show that modelers had some input during the design phase.

Esthetical and practical are not mutually exclusive, the proof are the lights on the engine: finally someone mass-produces headlights with prototypical depth, a weathered brass retainer, convex glass and proper reflectors. The headlights can easily be removed from the holding pockets. Owners of the RhB Krok will be delighted to know that both prototype engines have identical lights.

The absence of light on the front left of a decoder equipped engine in analogue mode isn't an intermittent contact. It is a programming error of CV13. People who use the engine exclusively in analogue mode should have their dealer reprogram CV13 to a value of 252.

Electrical features

So that the lights don't flicker there are pickup brushes on all driving and tender wheels, as well as two detachable pick-up shoes on the tender. The flywheel on the motor enhances the drive characteristics - which compensates for the omission of a buffer capacitor to negotiate short sections of track with insufficient or missing power. Those who wish to can add the respective parts themselves, they are available from Dietz and other suppliers.

Digital operation

Despite equipping the G 4/5 with a multi-protocol decoder that can handle both the NMRA-DCC as well as the Motorola format, the factory set-up is geared to the spartan LGB MTS system with only 14 speed steps. On the other hand this ensures that even MTS owners with old equipment, like the Lok-Handy with serial functions, will be able to get the engine running. The decoder is an Uhlenbrock type which Dietz modifies with plug connectors and the programming is for the Lok-Handy mode with 8 functions activated through CV49.

All other, better equipped digital users should reprogram if they like to use the DCC mode with the full functions of their system. Start by changing the settings of the decoder – all settings are aimed at the 14 speed step LGB-MTS set-up – CV29 (factory set to 4) and CV49 (factory set to 2): for 28 speed steps and automatic analogue/digital switching the value of CV29 needs to be 6 (sum of bit1 = value 2 and bit 2 = value 4).

CV49 will then usually set to “0”; unless one uses the feature to have the engine accelerate at the end of a stopping section with the pre-programmed values (using CV52; one can utilize this to have a train slow into the station). Setting only the tender on the track for the programming suffices since the decoder as well as the sound board - connected via a SUSI interface - are located in the tender.

The basic decoder values of the G 4/5 are nicely matched to the drive characteristics of the engine. Speed step 1 results in the equivalent of a very smooth “less than 1km/h” speed. The top speed of

45km/h is reached with speed step 24/25 (when using 28 speed steps), there is plenty of leeway for adjustment. The BRAWA factory setting of the overload function is quite conservative. After extensive running tests, BRAWA now recommends to set CV60 to a value of 247, this in order to prevent the decoder from shutting down at less than the safe current draw.

Not as easy to eliminate through reprogramming is the growling of the motor which is caused by the Back-EMF detection function. It is most noticeable on indoor layouts, hardly noticeable in the garden with the sound activated. (Regarding the motor noise please refer to the update at the end of the review. *HJM*)

In digital mode we really like the selection of the “Engine only” or “Engine with train” function using F3. Actuating F3 once changes to “Engine only”, complete with a metallic uncoupling sound and in addition the decoder by-passes the selected load simulating acceleration and braking values. The engine brake squeal then corresponds to the no-load condition.

When the train stops the smaller smoke generator of the vacuum pump will run for about ten seconds.

Sound clips of the original are used to generate the realistic Dietz-Sound and the volume adjustment is really simple. Open the smoke box door and adjust the potentiometer to the desired value. The two chuff exhaust sounds in our opinion considerably better than the prototypical four chuff.

Garden railroaders who thrive on programming can also adjust the volume

by using CV902 of the SUSI equipped sound module. By the way: The smoke generator puffs are synchronized with the sound of the exhaust.

Conclusion

As far as the optics go, the mass-produced model from BRAWA is the equal of the small, limited series all-metal product from Magnus.

Unsurpassed is BRAWA's engine in the trio with Kiss and Magnus when it comes to operation and value. The features on the digital version are, with the exception of the buffer capacitor, very complete and leave nothing to be desired. The finish is very clean and the workmanship flawless. And: such finely reproduced and finished valve gear on a still-affordable engine in Large Scale is a dream come true.

Those who operate with analogue control and plan to do so in future can with confidence buy the analogue version and if they so desire later change to digital. This can be done without a problem: the Dietz decoder used by BRAWA is equipped with plug-in connectors and can easily be exchanged for the analogue circuit board.

Brawa's first IIm engine has raised the bar for mass-produced models - it also raised the bar for the garden railroader how to treat a finely crafted model engine, which is not designed for toy train curves. Which doesn't mean one has to shy away from using the engine outside, as long as the track is clear and the radii are best not below 1200mm (R3).

Hans-Joachim Gilbert / *HJM*

BRAWA G 4/5 #108

Technical Specifications

Length over buffers:	621mm
(Shortest draw bar)	
Largest width:	121mm
(Drain taps on tender)	
Max height	
above railhead:	168mm
Minimum radius:	600mm
b u t b e t t e r :	
>1200mm	
Weight Engine:	4.2 kg
Weight Tender:	1.0kg
Draw Bar Pull	8.9N

Pluses and Minuses

↑	Scale reproduction
↑	Nice, prototypical finish
↑	Abundant optical detail
↑	Abundant technical features
↑	Clean workmanship
↑	excellent running qualities in DCC mode
↑	User friendly design
↓	Back-EMF detection generates motor noise
↓	Fragile parts on running gear
↓	Incomplete instructions in the otherwise large manual

Ratings

BRAWA, preserved engine G 4/5 # 108 of the Rhaetian Railway

Scale: 1:22.5 Gauge: 45mm

Scale: ●●●●●

Detailing: ●●●●●

Paint and Lettering: ●●●●●

Running Gear: ●●●●●

Current collection: ●●●●●

Production Quality: ●●●●●

Operation Reliability: ●●●●●

(Larger than R3)

Instruction Manual: ●●●●

Value (Benefit:Price): ●●●●●

Our ratings: ●●●●● is excellent
● is poor

This is copy/pasted from the BRAWA website

Latest customer information CONVERSION OF THE DIGITAL G 4/5 (Item No. 10001, IIm GAUGE)

After distribution of the G 4/5, it turns out that on the digital version of the locomotive, the decoder switches off under certain circumstances. In normal operation, the locomotive behaves completely faultlessly and distinguishes itself through particularly quiet running characteristics. However, the decoder can in certain situations switch off when the locomotive is driving slowly – although only on inclines and when pulling heavy loads. In the past days, the Brawa developers have very carefully examined how the motor and decoder interact. Various approaches for resolving the situation have been discussed – including simply updating the decoder's software. We have now ruled out this approach, since we prefer a lasting solution that accords with the normal high standard we strive for. What solution is Brawa offering its customers? Brawa will convert the digital version of the G 4/5 (Item No. 10001) free of charge to a different motorization. A 24V motor from Maxon will be used instead of the Mabucchi motor used so far. We would at this point like to stress once again that the Mabucchi motor is a high-quality motor with adequate reserves of power. The experiences of garden railway fans who decided on the analogue version quite clearly confirm this. Replacement of the motor represents the best solution, especially in view of the interaction of the motor and decoder. 1)

Can customers carry out the conversion themselves? No – the conversion of the G 4/5 will be done exclusively by Brawa. This will ensure that the conversion is performed correctly and that our customer's guarantee rights are unaffected. Since the Maxon motor rotates significantly faster, the necessary gearing down will be realised through a combination of two toothed wheels and a toothed belt. The conversion will also involve reprogramming of the decoder to the motor-specific parameters.

When will conversion of the locomotives begin?

In addition to the motor, the conversion will require specific new components for gearing down the drive and for supporting the motor, for example, which will be manufactured by Brawa. We apologise for the fact that the Brawa developers will need a little time for the conversion. The tools for manufacturing the additional components are already being made so that production of the components can take place as quickly as possible. We anticipate being able to begin conversion of the locomotives from the beginning of February 2006.

Must owners avoid operating the locomotive in the meantime?

No – up to the time of conversion, you can of course continue having fun driving your G 4/5! Simply avoid situations that combine the three factors already mentioned (slow driving on inclines under full load).

How is the conversion organised?

Brawa will make a form available on the website from 19 December, which you will use to register for the conversion of your locomotive. 2) After that, you merely bring the G 4/5 to your dealer from 16 January 2006 onwards. We have chosen this method to avoid the need for postal shipment using inadequate packaging. After all, it is important that the locomotive survives transportation without damage. Brawa will see to its collection and, after conversion, will send the locomotive directly to your home – carefully packed for transportation. The conversion of your locomotive will be carried out as quickly as possible.

Günter Braun
Managing Director

1) The offer of free-of-charge conversion applies also to customers who have already digitalized an analogue version of the locomotive themselves with a decoder. 2) Your dealer will be happy to provide you with a printed version of the form if required.

Disguised as railfans from a model railway club, the BRAWA employees researched the details of the RhB G 4/5 Consolidation starting in the Spring of 2004. No one was to get even the slightest hint of what was to be the biggest surprise at the 2005 Nürnberg Toy Fair. .

How does one go about designing and building a model without others getting wind of the project? Not even the employees of the RhB should notice that BRAWA was planning a very secret project: Four of the Museum cars along with engine 108 were to be presented at the 2005 NTF: a most spectacular entry into the Large Scale scene. Ordinarily one would use the contacts and official channels - a few phone calls would be sufficient to get the pictures and drawings required to give the designers a good start. But no, there were no simple shortcuts for the BRAWA designers. The Boss ordered “Top Secret...no exceptions!”..

Even at the meeting of the sales personnel the evening prior to the NTF opening the IIm entry project was never mentioned. “The only thing one sensed was the lack of a real highlight for the show” is what one of the employees, who was in the know, remembers.

