Bedienungsanleitung
Instruction
Instructions de Service

Für drinnen und draussen - For indoors and outdoors

Achtungl
Verpackung und Betriebsanleitung aufbewahren!
Nicht **für** Kinder unter 8 Jahren geeignet, modellbedingt besteht Quetsch- und Klemmgefahr durch Antriebsgestange der Lok.
Nicht **für** Kinder unter 8 Jahren geeignet, wegen funktions- und modellbedingter scharler Kanten und Spitzen.

Attention!
Save the supplied instructions and packaging!
This product is not for children under 8 years of age. It has moving parts that can pinch and bind.
This product is not for children under 8 years of age. This product has small parts, sharp parts and moving parts.

Attention!
Veuillez conserver l'emballage et le mode d'emploi
Ne convient pas aux enfants de moins de 8 ans. L'embiellage de la locomotive peut pincer les doigts de jeunes enfants.
Ne convient pas aux enfants de moins de 8 ans. Presence de petits **éléments** susceptibles **d'être avalés.**

Attenzione!
Conservare l'imballo e le istruzioni per l'uso!
Non adatto a bambini di **età** inferiore agli 8 anni poiche vi **è** possibilita a pericolo di schiacciamento delle dita quando il treno **è** in funzione.
Non adatto a bambini di **età** in1eriore agli 8 anni in quanta le strutture presentano spigoli vivi e punte accuminate.

Atencion!
Guardar el carton de embalaje y las Instrucciones para el uso!
No adecuado para ninos menores de 8 anos. **Según** el modelo, existe el peligro de sufrir contusiones 0 de cogerse los dedos a causa del varillaje de accionamiento de la locomotora.
No adecuado para ninos menores de 8 anos, debido a cantos y puntas peligrosas condicionadas por la funcl6n 0 el modelo.

Attentie!
Verpakking en gebruiksaanwijzing bewaren!
Niet geschikt voor kinderen onder de 8 jaar omdat deze loc aandrijfstangen bezit waaraan kinderen zich kunnen bezeren.
Niet geschikt voor kinderen onder de 8 jaar omdat dit model funktionele scherpe kanten en punten bezil.

Anderungen der technischen AusfOhrungen vorbehalten.
We reserve the right to make technical alterations without prior notice.
Modifications de constructions réservées.

20520/42

1.50302 PF

20520

DC = 0-24 V

CE

OBB·Diesellok 2091·03

DASVORBILD
Bei den 6sterreichischen Schmalspurbahnen wurden bereits ab 1927 Dieselloks verwendet, um einen wirtschaftlicheren Betrieb zu erm6glichen. 1936/37 wurden sieben Serienloks der damaligen Baureihe 2041 (heute 2091) fOr verschiedene Schmalspurbahnen der Osterreichischen Bundesbahnen gebaut.

Um den normalerweise im Zug mitlaufenden Gepackwagen einsparen zu k6nnen, erhielten die Lokomotiven ein groBes Gepackabteil. Ein V8-Dieselmotor treibt Ober einen Generator und zwei Elektromotoren die beiden Treibachsen an. Die Baureihe 2041/2091 wurde auf fast allen 6sterreichischen Schmalspurbahnen eingesetzt. Dabei konnte die

ERNST PAUL LEHMANN PATENTWERK
Saganer Str. 1-5 · D-90475 Nürnberg

made in Germany

L·G·B

20520
ÖBB Diesel Loco, 2091-03

THE PROTOTYPE

The Austrian narrow gauge rail-ways used diesel locomotives as early as 1927 in their quest for more economical operations. In 1936 and 1937, seven standard-ized "2041" locos (later re-num-bered 2091) were built for various narrow gauge lines of the Austri-an Federal Railways.

For further cost savings, the loco-motives were equipped with a large baggage compartment, eliminating additional baggage cars. The transmission is diesel-electric, which is unusual for European locomotives. A V8 diesel engine turns a generator, which feeds power to the two electric motors that drive the wheels. The *2041/2091* locos were used on many Austrian nar-row gauge lines, where its top speed of 50 kph (31 mph) rarely could be achieved.

Designed with economy in mind, the locos were not very powerful. As a result, they were used main-lyon level tracks, hauling light passenger trains consisting of two four-axle or four two-axle coach-es. For hilly lines or heavy trains, steam locomotives were used until the big 2095 diesel locos became available in the 1960s.

Loco 2091-03 today is owned by the preservation group Club 760, where it has been restored in its original shape. You can enjoy a ride behind this charming loco on the scenic Taurachbahn (www.club760.at).

THE MODEL

This detailed replica features:
- weather-resistant construction
- factory-installed onboard decoder for MTS and analog operation
- opening doors to cab and bag-gage compartment
- four-way power control switch
- protected gearboxes with two seven-pole BOhler motors
- eight powered wheels
- one traction tire
- twelve power pickups
- voltage stabilization circuit
- automatic directional lanterns
- multi-purpose socket with circuit breaker
- length: 460 mm (18.1 in.)
- weight: 2600 g (5.7 lb.)

THE PROGRAM

With this model, we recommend the following items:
- 33620 CBB Passenger Car
- 33625 CBB Bar Car
- 38078 CBB Passenger Car
- 65002 European Diesel Sound Unit (to equip the model with sound)

For information on the complete LGB program, see the LGB cata-log.

OPERATION

Operating Modes
This model has a four-way power control switch mounted inside the baggage compartment (Fig. 1, 2):
Position 0: All power off
Position 1: Power to lights
Position 2: Power to lights and motors
Position 3: same as Position 2 (factory pre-set)

Multi-Train System
The model is equipped a factory-installed onboard decoder for the LGB Multi-Train System. It can be used without modifications. on analog or digital layouts. For oper-ation with the Multi-Train System, the model is programmed to loco address 03. For information on programming the loco address, see the instructions for various MTS components.

When operating with the Multi-Train System, you can remotely control the loco's functions. Press the lighting button ("9" with remotes) to turn the loco lights on or off.

When operating with the Multi-Train System, the loco features a "Back-EMF" function. This keeps the motor speed constant (and under normal conditions the loco speed), even when the load of the loco changes, for example, in curves or on grades. This feature does not work at top speed, because additional voltage must be available to overcome any added load.

If desired, numerous functions of the onboard decoder, such as acceleration, braking, direction of travel and many others, can be programmed using a PC and the 55045 MTS PC Decoder Pro-gramming Module (see "Instruc-tions for advanced users"). These function can be programmed from the 55015 Universal Remote as well.

Lighting
This model features directional lighting. The model has a "flat" multi-purpose socket, with a removable cover, on the rear of the loco (Fig. 3). This socket can be used to provide track power to LGB cars with lighting or sound electronics.

To remove the cover of the sock-et, pull it straight out. If the cover is tight, gently use a small straight screwdriver to pry it out. (Do not pull out the rectangular outer housing.)

Power Supply
Attention! For safety and reliabil-ity, operate this model with LGB power supplies (transformers, power packs and controls) only. The use of non-LGB power sup-plies will void your warranty.

Use this model with LGB power supplies with an output of more than 1 amp. For more information on LGB power supplies for indoor, outdoor and multi-train operation, see the LGB catalog.

Attention! After extended opera-tion, this model may leave carbon dust or other debris around the track. This dust and debris can stain carpet and other materials. Consider this when setting up your layout. Ernst Paul Lehmann Patentwerk and LGB of America are not liable for any damages.

SERVICE

Do-It-Yourself Service Levels
Level 0 - Beginner
Level 2 - Intermediate
Level 3 - Advanced

Attention! Improper service will void your warranty. For quality service, contact your authorized retailer or an LGB factory service station (see Authorized Service).

Hint: Additional expert instruc-tions for many LGB products are available at www.lgb.com.

Lubrication 0
The axle bearings should be lubri-cated occasionally with a small amount of LGB Maintenance Oil (50019).

Cleaning 0
This model can be cleaned exter-nally using a mild detergent and gentle stream of water. Do not immerse this model.

Replacing the light bulbs 0
Lower lights: Pull the lantern housing away from the model. Remove and replace the bulb. Reassemble.

Upper lights: Remove the ring around the lantern lens. Carefully pry the lens away from the lantern. Using tweezers, remove and replace the bulb. Reassem-ble.

Cab light: Using tweezers, remove and replace the bulb.

Replacing the traction tire 2
- Use a small, straight-blade screwdriver to replace the trac-tion tire:
- Pry the old traction tire out of the wheel groove.
- Gently insert the new traction tire into the wheel groove.
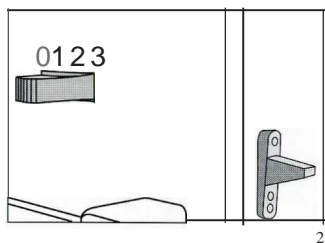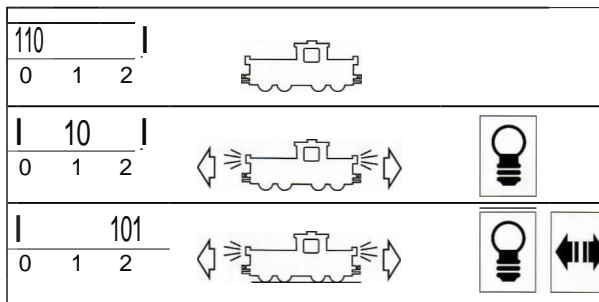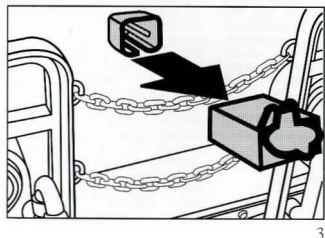- Make sure that the traction tire is seated properly in the wheel groove.
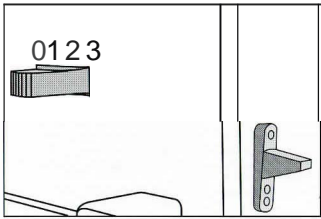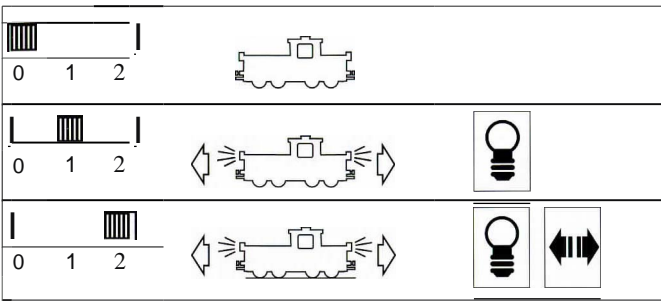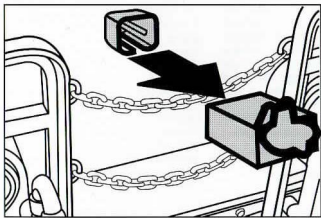
Abb. 1, 2: Betriebsartenschalter
Abb. 3: Mehrzweck-Steckdose

USA GB

Fig. 1, 2: Power control switch
Fig. 3: Multi-purpose socket

Illustr. 1, 2: Selecteur d'alimentation
Illustr. 3: Oouille à usages multiples

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(USA) (GB)

Fig. 1, 2: Power control switch
Fig. 3: Multi-purpose socket

Illustr. 1, 2: Selecteur d'alimentation
Illustr. 3: Douille à usages multiples

Maintenance parts
50019   Maintenance Oil
51020   Gear Lubricant
62201   Standard Motor with
        Short Shaft
63120   Brushes, Assembled,
        14mm and 16mm,
        8 pieces (2 packages
        needed)
63218   Standard Pick-Up
        Shoes, 2 pieces
        (2 packages needed)
68511   Plug-In Bulb, Clear, 5V,
        10 pieces
69104   Traction Tire, 37.5mm,
        10 pieces

INSTRUCTIONS FOR
ADVANCED USERS

MTS Onboard Decoder

Programming functions
You can program numerous func-
tions of the onboard decoder to
suit your requirements. If you
want to do this, program the
"function values" in "registers"
(CVs) using a PC and the 55045
MTS PC Decoder Programming
Module. You can also program the
function values using a 55015
Universal Remote.
Hints:
- For normal operation, it is not
  necessary to change the func-
  tion values.
- If programming results in unsat-
  isfactory operation, you can
  reprogram the factory pre-set
  values of most important CVs:
  Program register CV55 to func-
  tion value 55. This also repro-
  grams the loco address to the
  factory pre-set value.
To reprogram the factory pre-set
function values with the 55015
(displays shows "P _") input 6, 5,
and 5 and press the right arrow
button. The display shows "P --"
again: Input 5, 5, and 5 and press
the right arrow button again.

You can program the following
registers:

Register	Function	Available values	Factory pre-set
CV1	Loco address	1(00..22)	[31
CV2	Starting voltage voltage for speed setting 1 - if loco starts only at a higher speed setting, increase value. With "Back-EMF" function active, the factory ore-set value should not be chanaed.	(0..255)	[0]
CV3	Acceleration 1 - fast, 255 - slow)	1(1..255)	[31
CV4	Braking (1 - fast, 255 - slow)	(1..255)	[3]

Hint: When programming with the 55015 Universal Remote, the following CVs are programmed by input of the number of the desired CV in CV6 and then input of the desired function value in CV5 (see example below).

Register	Function	Available values	Factory pre-set
CV5	Max. voltage Voltage for highest speed step - if a lower top speed is desired, decrease value. With "Back-EMF" function active, the factory ore-set value should not be chanaed.	(1..255)	[255]
CV5	after input of CV6 function value for CV to be oroarammed		
CV6	CV to be oroarammed		
CV29	Configuration Normal direction: 4 = Analog and digital, factory-programmed speed steps O = Digital only, factory-programmed speed steps 20 = Analog and digital, user-programmed speed steps 16 = Digital only, user-programmed speed steps Reversed direction: 5 = Analog and digital, factory-programmed speed steps 1 = Digital only, factory-programmed speed steps 21 = Analog and digital, user-programmed speed steps 17 = Digital only, user-programmed speed steps With "Analog and digital:" - Loco can operate on analog and digital layouts With "Digital Only:" - Normal operation on digital layouts. - Ooeration on analoa lavouts not oossible.		[4]
CV52	Command for front light terminal O = control via lighting button 1 = control via button 1 (buttons F2-F8 not used) 9 = control via button 1 (buttons F2-F8 used) 10 = control via button 2 11 = control via button 3 12 = control via button 4 13 = control via button 5 14 = control via button 6 15 = control via button 7 16 = control via button 8 64 = control via lighting button (On only when reversing) 65 = control via button 1 (On only when reversing) 128 = control via lighting button (On only when moving forward) 129 = control via button 1 (On only when moving forward)		[128J
CV53	command for rear light terminal , (see CV52)		[64]
CV54	Hand-off function and "Back-EMF" O = hand-off function off, Back-EMF off 1 = hand-off function on, Back-EMF off 2 = hand-off function off, Back-EMF on	(0..3)	[2]

	3 =hand-off function on, **Back-EMF** on Hand-off function on: When operating with 55015, you can adjust direction and speed for two seconds after selecting a moving loco without causing the loco to stoP.		
CV55	Reset of most programmed CVs 55 =most important CVs are reset to the factory Dre-set values		
CV60	Back-EMF: Max. adjustment factor (0: small, 255: large) Specifies the max. increase or decrease of voltage applied during each time interval (programmed in CV61) **Attention!** The factory pre-set values of CV60 and CV61 are oDtimized for LGB motors.	(1..255)	[48]
CV61	Back-EMF: Adjustment frequency (0: often, 255: seldom) Specifies how often per second the motor voltage is adjusted - accordingly, the loco will react to curves and grades immediately or with a short delav	(0..255)	[0]
CV62	Back-EMF: Max. Adjustment (0: small, 255: max.) Limits the total adjustment in motor voltage. If there is a very large load on the motor, the adjustment will not exceed this value - for more realistic operations, so that locos will slow a bit on orades	(0..255)	[255]
CV67 to CV94	Speed steps programmed by user (see CV29): 28 speed steps are programmed in CV67 to CV94. With LGB MTS, every second value is skipped (14 speed steps). Factory pre-set speed steps: 7, 9, 11 , 13, 16, 20, 24, 28, 32, 36, 42, 48, 54, 60, 68, 76, 84, 92, 102, 112, 124, 136, 152, 168, 188, 208, 230, 255 Pre-set values for user-programmable speed steps: 8,16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96, 104, 112, 120, 128, 136, 144, 152, 160, 168, 176, 184, 192, 208, 224, 240, 255 Hint: The speed steps are factory pre-set and programming is not necessary. Use the 55045 MTS PC Decoder Programming Module for programming.	(0..255)	

General programming procedure with 55015 Universal Remote:
- Registers CV1 through CV4 can be programmed directly by programming the desired function value in the register.
- To program higher CVs:
  - In register CV6, input the number of the register you want to program.
  - Then input the desired function value in register CV5.

Example:
Set hand-over function to ON (program register CV54 to function value 3).
To program:
- Display shows "P --"
- Select register CV6 (press 6).
- Input 54 (register you want to program).
- Execute programming (press right arrow button).
- Display shows "P --"
- Select register CV5 (press 5).
- Input 3 (selected function value)
- Execute programming (press right arrow button).

When programming with the 55045, all function values are programmed directly.

AUTHORIZED SERVICE

Improper service will void your warranty. For quality service, contact your authorized retailer or one of the following LGB factory service stations:

CAUTION! This model is not for children under 8 years of age. This model has small parts, sharp parts and moving parts. Save the supplied packaging and instructions.

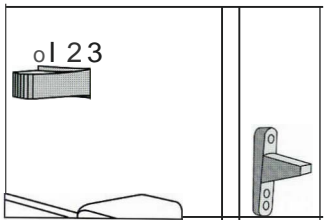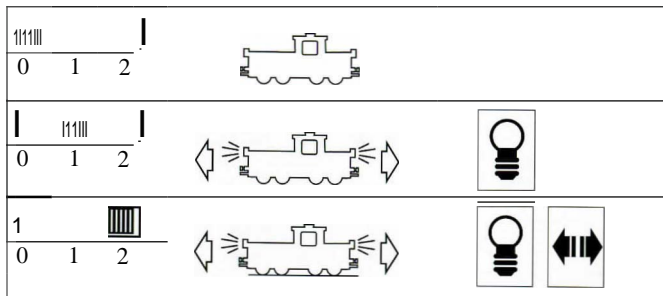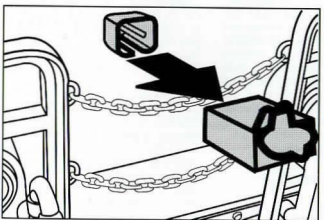| 1I11III		I		
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Abb. 3: Mehrzweck-Steckdose

USA GB

Fig. 1, 2: Power control switch
Fig. 3: Multi-purpose socket

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