CV	Register	Description	Range	Default
CV1	R1	Short address	1-127	3
CV2	R2	Start voltage	0-32	2
CV3	R3	Acceleration	0-32	5
CV4	R4	Deceleration	0-32	5
CV5	---	Top voltage	0-32	32
---	R6	Page number	---	---
CV29	R5	Basic configuration	---	2
CV7	R7	Manufacturer version number	---	25
CV8	R8	Manufacturer ID	---	143
CV17	---	Long address upper byte	192-231	192
CV18	---	Long address lower byte	0-255	3
CV19	---	Advanced consist address	0-127	0
CV21	---	When CV21=0, functions follow its own address. CV21=1, functions follow the consist address	---	0
CV49		Sound on/off except horn that is always on	0-1	1
CV50	---	Horn type (16 types)	0-15	8
CV51	---	Horn volume	0-3	3
CV52	---	Bell type (8 types)	0-7	7
CV53	---	Bell volume	0-3	2
CV54	---	Bell ring rate	0-50	3
CV55	---	Diesel rumble volume	0-3	3
CV56	---	Brake squeal volume	0-3	3
CV57	---	Dynamic brake volume	0-3	3
CV58	---	Air release volume	0-3	3
CV59	---	Air pump volume	0-3	3
CV60	---	Safety pop valve volume	0-3	3
CV61	---	Engine cooling fan volume	0-3	3
CV62	---	Coupling volume	0-3	3
CV64	---	Rail wheel clack	0-3	3
CV65		Kick start voltage	0-63	63
CV67-94		28 speed steps table while CV29.4=1	1-255	linear
CV105	---	User identification number	0-255	0
CV106	---	User identification number	0-255	0
CV113	---	Coupling fire volume	0-3	3
CV114	---	Brake release volume	0-3	0
CV115	---	Auto brake squeal enable/disable	0-1	1(enable)
CV122	---	Notch mode, 0=auto, 3=manual	0-3	0
CV124	---	Load compensate control enable	0-1	0(disable)
CV125	---	Programming to "1" will restore some CV's to factory settings	---	0

DC PROGRAMMING

Move the throttle to 60%. Turn off the power switch and wait 2 seconds. Press and hold button #6 as you turn ON the power switch. When you hear "Program", quickly release button #6. Now you are in program mode.

You can follow the DC Program table to perform 30 programs in one programming session. If you need more than 30 programs, turn off power and re-enter program mode to start a new session. It takes 2 seconds to perform one program so always wait 2 seconds before performing the next program.

TROUBLE SHOOTING

- If the decoder does not work, it may have simply lost its address. Please use **program track** to program CV# 125 with value 1 to restore the decoder to factory settings. This should bring the decoder to life with an address #3.

- If it does not have sound, use F12 to turn on the sound. F12 is sound on/off.

- Do not operate this decoder at a track voltage greater than 18volts.

- If the locomotive responds too slowly, you should clear its momentum by reprogramming CV3 and CV4 to zero.

- If the speed is too fast at step 1, you should program start voltage, CV2 to zero.

- If its top speed is too slow, program top voltage CV5 to 31.

- If your locomotive runs erratic or is not starting smoothly, you should clean the track to improve electrical pickup.

- Refer to your DCC system manual to learn how to program, read back and operate the decoder. For more information about registers/CVs and their functions, please refer to the NMRA DCC Standard & Recommended Practices, RP-9.2.2. This is available directly from the NMRA or their website at **www.nmra.org**.

FCC COMPLIANCE

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions. (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

RETURN PROCEDURE

This decoder carries a 6 month warranty against factory defects. This warranty **does not** include abuse, misuse, neglect, improper installation, or any modifications made to this decoder, including but not limited to the removal of the NMRA plug if applicable. If it should become necessary to return the decoder for warranty repair/replacement, **please include a copy of the original sales receipt**. Please include a letter (printed clearly) with your name, address, daytime phone number, and a detailed description of the problem you are experiencing. Please also include a check or a money order for $8.00 to cover return shipping and handling. If the decoder is no longer considered under warranty, then please include a check or a money order for $29.00 to cover the cost of repair or replacement and the return shipping and handling. *Be certain to return the decoder only. Any questions regarding Warranty Policy can be directed to our Customer Service Department by calling 732-225-6360 between the hours of 8:30am and 6:00pm EST, or by emailing: rrtech@modelrectifier.com*
Send the decoder to:

Model Rectifier Corporation
Attn: Parts & Service
80 Newfield Avenue
Edison, NJ 08837-3817 U.S.A

Printed in USA

DC/DCC HO Diesel Sound Decoder For Walthers GP15-1

Item #0001750 (with wireless remote)

Thank you for purchasing this MRC DC/DCC Diesel sound decoder. It is a drop-in decoder designed for Walthers GP15-1. The prime mover sounds for this decoder were recorded directly from the real prime mover for this type of locomotive. All notching along with increased speeds were also part of the recording process. Unlike some others, we do not use simply increase volume or frequency of the prime mover sound to simulate the notching process. The decoder has presets for all of its functions, so no adjustments should be required. However if you wish to make changes, this decoder has a full range of options. So now go ahead and enjoy.

FEATURES

- 1.5 amp capacity
- 16 different horns and 8 bells
- Individual sound volume adjustment
- 2-digit (1-127) and 4-digit (1-9999) addresses
- Programmable starting voltage and top end voltage
- Programmable acceleration and deceleration rates
- Full READBACK of all CV's
- 14, 28, 128 speed steps
- Speed table (CV 67-94), Kick start (V65)
- Directional lighting (F0).
- Back EMF and load compensation control
- 28 accessory functions (F1-F28)
- Supports advanced consisting (CV19)
- Supports programming on the main (OPS mode)
- Compatible with NMRA DCC standards
- Complies with Part 15 of FCC
- 16x36mm speaker with baffle
- Dimensions: 114.0mm x 18.0mm x 11.0mm

INSTALLATION

Remove body shell. Remove rear light from its holder to expose screw. Unscrew and remove the rear light holder. Disconnect all wires before removing the original PCB. Mount the new speaker and decoder as shown below. Reinstall rear light holder. Realign the PCB to the CHASSIS before tightening all screws. Follow the wiring diagram to reconnect wires. There are two short wires (black and red) for connecting the rear light. Please match the color to connect the rear light. We recommend you solder wires for a more reliable connection. If you wish instead to use tab caps to connect wires, please twist the wire end carefully and leave only 3 mm of stripped wire. Please make sure no stripped wires touch any components on the decoder. Failure to do so may damage the decoder.
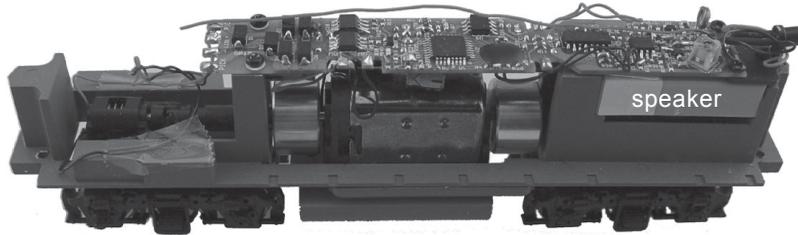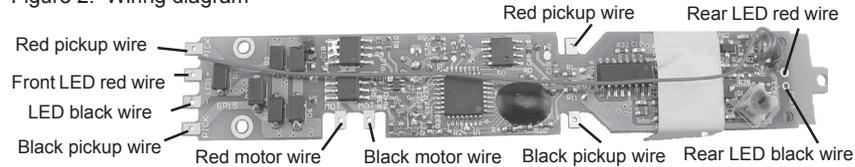
Figure 2. Wiring diagram

Red pickup wire
Red pickup wire
Rear LED red wire
Front LED red wire
LED black wire
Black pickup wire
Red motor wire
Black motor wire
Black pickup wire
Rear LED black wire

DCC OPERATION

The decoder should perform well without any programming. Its starting and top voltages have been PRE-TUNED for your GP15 loco. All you need to do is set its address. The factory setting is address #3.

The decoder has start up and shut down features. If the loco was previously shut down, you have to start up the engine by pressing any function key. Once started, you can use the throttle to control loco speed. You can use F0 to turn on/off headlight. When you turn off headlight, the light will fade away, just like real headlight. To shut down the engine you must bring the loco to idle and then press F8 three times.

The decoder can operate at very slow speeds. We have achieved 1.5 inches per minute at factory with load control off and 128 speed steps. If you feel that the starting speed is too slow, you can program the start voltage, CV2, to increase its value. Always read back the CV value first before changing its value.

The decoder has 16 different horns and 8 different bells. You can use F19 to select a horn and F18 to select a different bell sound. With MRC Prodigy Advance² or the Prodigy Wireless, you can easily set up and access all the decoder's 28 functions. If you are not using a Prodigy DCC System and it does not provide access to all 28 NMRA functions, you may not be able to access all the features of the decoder and have to use CV programming to set up the decoder.

The decoder default is set to automatic notching. You can program CV122 to 3 for manual notching if you so desire. for realistic operation. And then use F9 to notch up and use F8 to notch down.

If when using this decoder it becomes non responsive, it may have lost its address. Please **use the program track** to program CV# 125 with value 1 to restore certain CV's to factory settings. Or you can also program the loco to address 3. This should bring the decoder to life with an address #3.

Function	Idle/Moving
F0	Headlight on/off
F1	Bell on/off
F2	Horn
F3	Air release
F4	Coupling 1
F5	Brake release (idle) / brake squeal (moving)
F6	idle shifting during idle
F7	Air hose firing/uncoupling lever
F8	Click 3 times during idle will shut down / notch down while CV122=3
F9	Engine cooling fan / notch up while CV122=3
F10	Rail wheel clack (only moving)
F11	Traction air compressor
F12	Sound on/off
F13	Air release
F14	Coupling 2
F15	Air pump
F16	Associated loco sound
F17	flange noise 1
F18	Change bell type (use F1 to turn off bell after adjustment)
F19	Horn type select (total 16 different horns)
F20	Reversal gear
F21	Change bell volume (use F1 to turn off bell after adjustment)
F22	Change horn volume
F23	Change diesel rumble volume
F24	air release
F25	flange noise 2
F26	flange noise 3
F27	sand drop
F28	air release

There are many more features available with this decoder. Please refer to the CV and function Chart to explore all features of this decoder.

SPEED TABLE CV67-CV94 FOR 28 SPEED STEPS

This feature can be a little difficult for first time users. However it is a nice option if you wish to consist (lash) this locomotive with another model that has a different speed range.

The speed table feature allows you to program every speed increment of all 28 speed steps. You can customize the speed curve. In order to use the speed table control you have to set CV29's bit 4 to 1.To get there, you can program CV29 to 18 for short address or to 50 for a long address). When you operate the loco at 28 speed steps, the decoder will use the speed table formed by CV67-CV94 to control speed (motor voltage). {If you own a MRC Prodigy Express, Advance or Wireless system we recommend you to order the MRC computer interface to program your decoder's speed table. JMRI software can be used for other systems}.

Now select throttle to 28 speed steps and operate your loco at speed step 1. Use program CV on the main to change CV67's value (1-255) to adjust step 1's speed. You may also need to adjust the kick voltage, CV65, to get a nice slow speed at speed step 1. The kick voltage is the voltage kick in when the speed step changes from 0 to 1. When done with CV67, select speed step 2 and program CV68. CV68's value must be greater than CV67's. When done with CV67-CV94, use the read back CV feature to make sure their values are in an increasing order.

Note: When using MRC Prodigy DCC or some other systems, programming in a new address will automatically disable the speed table (because it sets CV29's bit 4 to "0"). Programming CV125 to 1 will also disable the speed table and re-program CV67-CV94 to a default linear speed setting. If you have the MRC software interface, you can read back the speed table and it will draw the speed curve for you.

DC OPERATION

You can use the enclosed transmitter to speed up, slow down, change direction, and stop the loco. You can also use the transmitter to control sounds such as bell and horn.

The decoder can also be operated by a regular DC power pack. The loco will start up around 7V or 60% throttle setting. You can use the power pack throttle to control speed. However, once you use the enclosed handheld transmitter to control loco speed, it will disable the power pack throttle. To enable the throttle again you have to flip the direction switch on the power pack. The transmitter does not work properly at lower voltages. We recommend you set 85% throttle and use transmitter to control your loco. Note, the maximum speed possible from the remote transmitter is based on the maximum setting of the power pack throttle. If the power pack throttle is set 70%, then the maximum speed using the remote will not reach the top speed. Lower throttle settings could reduce the transmitter range. If the range needs to be extended, we recommend letting the antenna touch the track during operation for more reliable control. Please avoid pressing buttons too rapidly in sequence and also avoid pressing and holding buttons. These precautions will provide optimal performance and battery life. Please follow the DC function table to DC operation.

Button	Running mode	Program mode
Button1	Bell on/off	Change bell
Button2	Horn	Change horn
Button3	air release	Change bell volume
Button4	idle shifting during idle, rail clack during moving	Change horn volume
Button5	Stop	Change brake volume
Button6	Light on/off	
Button7	Reduce speed. Air release at zero speed	reduce start voltage by 1
Button8	Increase speed, Air release at top speed	increase start voltage by 1
Button9	change direction	Sound on/off

Bell
Horn
Air release
Head light
Stop
rail clack
Speed up
Speed down
Direction
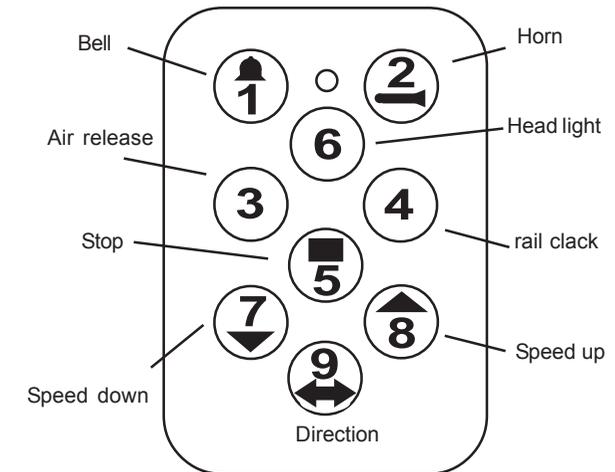
Note: The transmitter operates on a 12V (A123) battery, readily found in most stores that sell electronic equipment.