PROGRAMMING

This decoder supports all program modes and read back features. With MRC Prodigy Advance DCC you can read its address and CV value.

CV	Register	Description	Range	Default
CV1	R1	Short address	1-127	3
CV2	R2	Start voltage	0-32	0
CV3	R3	Acceleration	0-32	0
CV4	R4	Deceleration	0-32	0
CV5	---	Top voltage	0-32	32
CV6		Speed curve select (0=linear, 1=slow increase at slow speed, 2=fast increase at slow speed	0-2	0
---	R6	Page number	---	---
CV29	R5	Basic configuration	---	2
CV7	R7	Manufacturer version number	---	32
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, all accessory functions will follow its own address. When CV21=1, all functions will follow the consist address	---	0
CV49		All sounds on/off, horn is always on	0-1	1
CV50	---	Horn type (34 types)	0-33	4
CV51	---	Horn volume	0-3	3
CV52	---	Bell type (8 types)	0-7	3
CV53	---	Bell volume	0-3	3
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
CV113	---	Coupling fire volume	0-3	3
CV114	---	Brake release volume	0-3	0
CV115	---	Auto brake squeal enable/disable	0-1	1(enable)
CV116	---	Auto bell with horn enable	0-1	0(disable)
CV117		Light mode, 0=normal headlight 1=off, dim, bright cycle, 2=route 17	0-2	0
CV122	---	Diesel notch mode, 0=auto-notch 3=manual notch	0-3	0
CV123		Prime mover sound on/ off with all accessory sounds on	0-1	0
CV125	---	Program it to1 will restore decoder to default address # 3	---	0

TROUBLE SHOOTING

This decoder should perform well with all DCC systems. The maximum DCC output should be less than 16 V. If the locomotive does not respond to commands, it may have lost its address. Please re-program the address and program CV19 to 0 (disable consist). If it responds slowly, you should clear its momentum by reprogramming CV3 and CV4 to zero. If step 1's speed is too high, you should program start voltage, CV2 to zero. If its top speed is too slow, program top voltage CV5 to 31. You should also clean the track to improve electrical pickup. Read your DCC system manual to learn how to program 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**. Whenever the decoder doesn't work please use the program track to program CV# 125 with value 1 to restore the decoder to factory settings. This should bring the decoder to life with address #3.

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 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

Dual Mode HO Gauge EMD 567B Diesel Sound Decoder
For Athearn Genesis F Units

Item #0001821

Thank you for purchasing our highly advanced DC/DCC Diesel locomotive sound decoder. This decoder will replace the OEM circuit board in Athearn Genesis F Unit Locomotives.

- Synchronized EMD 567B diesel prime mover sound
- 1.5 amp capacity
- 28 accessory functions, (F1-F28)
- Programmable choice of 34 different horns and 8 bells
- Programmable individual sound volumes
- Programmable for either 2-digit (1-127) or 4-digit (1-9999) addresses
- Programmable start voltage and top voltage
- Programmable acceleration and deceleration rates
- Full readback of all CV's
- Programmable 14, 28, 128 speed steps
- Selectable factory default speed curve
- CV 65 Kick start
- Custom programmable speed curve (CV 67-94)
- Directional lighting (FO) at 0.2 amp rate with special features and mars light
- Supports advanced consisting (CV19)
- Supports programming on the main (OPS mode)
- Compatible with NMRA DCC standards
- Complies with Part 15 of FCC
- 28mm speaker included
- Dimensions: 75.0mm x 17.5mm x 7.5mm

INSTALLATION

Remove the couplers and body shell from the chassis as per the Athearn Instructions. Make a note as to where each wire comes from and attaches to the OEM circuit board installed on the chassis. Remove the black plastic clips from the OEM circuit board that hold the wires to the board, (save these clips to re attach the wires to the decoder). Remove the old board and discard. Install the sound decoder in it's place, and reattach the wires using the plastic clips to the decoder using figure 1 as a guide. The speaker sits in the well on the rear of the chassis, (see figure 2 final installation photo). Before reinstalling the body shell and couplers, double check all wiring to make sure there are no wire strands shorting across connection tabs of the decoder. After reinstalling the body shell and couplers move the loco to a test track to check decoder installation.

Note- If installing this decoder into another type of locomotive. Make sure that the locomotive is DCC ready or you have made sure to isolate the wheel pick-ups, motor brushes, lights, etc., from the locomotive chassis following N.M.R.A. guidelines for decoder installation.

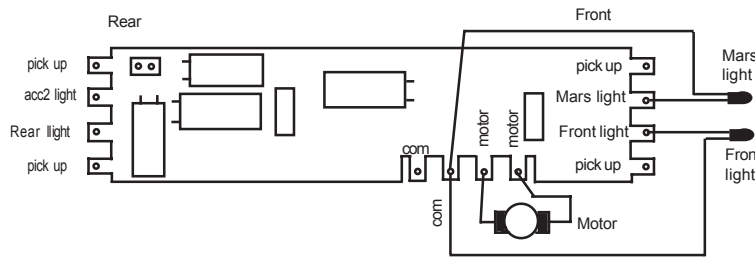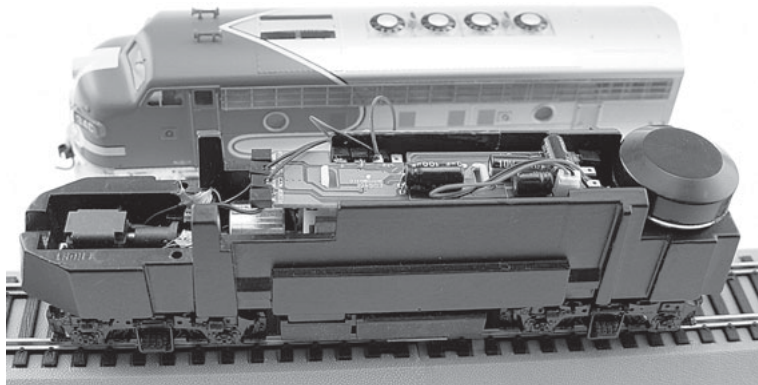figure 1 shows how to connect Athearn's 1.5V lights.

figure 2 final decoder installation.

MAKING A TEST TRACK

Before you begin decoder installation, we strongly recommend building a test track with a 27 ohm resistor to limit current. Only test your installed decoder on the test track. The test track may prevent damage from an incorrectly installed decoder. The test track is not a Program Track.
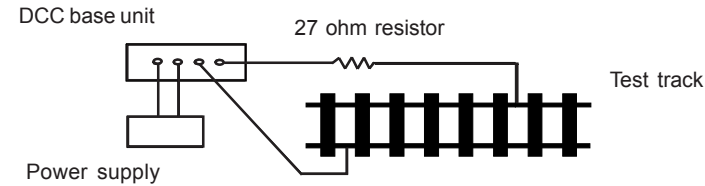

Figure 3. Diagram of test track

TESTING

The decoder has been programmed to address #3, 28/128 speed steps. To test, place the loco on the test track. Select address #3 and 28 speed step. Move up the throttle and the loco should move. Push the light button [F0] and headlight should come on. Change the direction of the loco and the loco should change direction. The loco cannot reach full speed, due to the resistor. If all the above occurs, you passed the test. Congratulations! Do not run the loco for an extended period of time on the test track or the resistor will overheat. If your installed decoder does not pass the test, find the problem, correct it and test it again. As long as you test the decoder on the test track there is little chance of damaging the decoder. This is why the test track is so important.

OPERATION

The decoder has start up and shut down features. If the loco was previously shut down you have to start up the engine. Press any function key to start up the engine before operating the loco. To shut down the engine you must bring the loco to idle and then press F8 three times.

The decoder has diesel prime mover sound on/ off feature. You can use F12 to turn on/off it. You can use F19 to select 34 different horn sounds and use F18 to select 8 different bell sounds. With MRC Prodigy Advance[2] DCC which has 28 functions, you can easily setup and access all the decoder's functions. If not, you may not be able to access all the features of the decoder. For other types of DCC systems you have to use CV programming to setup the decoder.

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

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

The decoder can also be operated by a regular DC power pack. This will give you synchronized engine sounds only. If you wish to enjoy the full array of sound functions using your DC power pack, the MRC Blackbox (item #0001050) for DC operation will allow you to control all of the sounds in your sound equipped locomotives. The MRC Blackbox is easy to setup and use.

Note: Bell, Dynamic Brake and Rail Wheel Clack cannot play at the same time. If you activate the Bell sound [F1], while either the Dynamic Brake or Rail Wheel Clack sounds are activated, the Bell sound will override the other 2 sounds. Rail Wheel Clack cannot play while the loco is in idle. When you turn off Dynamic Brake and Rail Wheel Clack sound there will be one second delay.

Function	Idle/Moving
F0	Headlight on/off, rule 17 or cycle of dim, bright, off (CV #117)
F1	Bell on/off
F2	Horn
F3	Mars light on/off with air release
F4	Uncoupling lever
F5	Brake release (idle) / brake squeal (moving)
F6	Dynamic brake on/off
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	Prime diesel mover sound on/ off
F13	Air release
F14	Coupling
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 34 different horns)
F20	Associated loco sound
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

SPEED TABLE CV67-CV94 FOR 28 SPEED STEPS

When CV29's bit 4 is set to "1" it will use the speed table formed by CV67-CV94 to control speed (motor voltage). It allows you to setup each speed for all 28 speed steps. First, program CV29 to 18 for short addresses (1-127) or program CV29 to 50 for long addresses (128-9999) to enable speed table control. Then select throttle to 28 speed steps and run 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. The kick voltage, CV65 is only applied when the speed step changes from 0 to 1. You should switch between 0 to 1 many times to check step 1's speed. When done with CV67, select speed step 2 and program CV68. CV68's value must be greater then CV67's. When done with CV67-CV94, use read back CV to make sure their values are in increasing order. Note: When using MRC Prodigy DCC to program addresses it will automatically disable the speed table (set 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.