

# Instructions for DH150K Decoder Installation

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## **DH150K** **Plug N' Play 1.5 Amp DCC Decoder** **for Some Atlas, Kato and Other** **HO Scale Locomotives**

1.5 Amp (2.0 Amp Peak) Mobile DCC Decoder

Easy, minimum solder installation

Supports Both Short (127) & Long (10,000) Address Modes

User Programmable Address, Acceleration, Deceleration,  
Start-voltage, Mid-point voltage, Max voltage and more

Programmable from DCC compatible equipment without opening the loco

Smooth conversion to analog operation with functions operational

5 User Configurable, Independent Function Outputs Rated at 200ma  
Use These as Regular Function Leads or Generate FX<sup>tm</sup> Special Lighting Effects  
Choose from Mars, Gyalite, Single or Double Strobe, Ditch Lights and more.  
(FX can be run on F0 Fwd, F0 Rev, F1 & F2)

Smooth locomotive speed control with user selectable  
14, 28, or 128 forward & reverse speed step capabilities

User loadable speed tables for customized speed control  
with 128 speed step resolution

Supports Basic, Advanced & UniVersal Consisting

User configurable loco direction of travel, you decide  
which way is forward without rewiring the motor

Compatible with the DCC Standard

Complies with FCC Part 15, class B RFI requirements

**Made in USA** Digitrax manuals & instructions are updated periodically.  
Please visit [www.digitrax.com](http://www.digitrax.com) for the latest version.



## DH150K Parts List

- 1 DH150K Decoder
  - 2 #1-72 x 1/2" countersunk thread forming screws
  - 2 0.325" spacers
  - 5 470 ohm 1/8w 1206 resistors\*
  - 4 .02" 26 gauge clear teflon insulating sleeving
- Instruction Sheet

\*These resistors are supplied for use with the LED's that come with the Kato C44-9W locomotive. User must be sure these values are appropriate for any other LED's or 1.5V lamps used in the installation of this decoder. Digitrax cannot be responsible for damage to lamps caused by use of inappropriate resistor values.

## Most Commonly Used CV's

Commonly Used Configuration Variables			Commonly Used Configuration Variables		
CV#	Used For	Default	CV#	Used For	Value
CV01	2-digit address	03	CV61	Directional Lights or White=F0 & Yellow=F4.	0 1
CV02	Start Voltage	0	CV49-54	FX <sup>tm</sup> Effect Set ups	See Manual
CV03	Acceleration Rate	0	CV65-95	Loadable Speed Tables	See Manual
CV04	Deceleration Rate	0			
CV05	Maximum Voltage	0			
CV06	Mid Point Voltage	0			
CV29	Configuration Register Examples	06=Advanced Mode, Analog Conversion On 04=Standard Mode (14 Speed Steps), Analog Conversion On 16=Enable Loadable Speed Table, Analog Conversion On, Advanced Mode 02=Advanced Mode, Analog Conversion Off (Recommended if Analog Conversion is not needed. 00=Standard Mode, Analog Conversion Off <b>Reverse Direction Values For CV29 in FX decoders:</b> 01=Standard Mode, Analog Conversion Off 03=Advanced Mode, Analog Conversion Off 05=Standard Mode, Analog Conversion On 07=Advanced Mode, Analog Conversion On 17=Enable Loadable Speed Table, Analog Conversion On  See Your Decoder Manual for a complete list of CV's and their values			

Damaged decoders should be returned directly to Digitrax for repair. The standard repair charge is \$17. Please be sure to include a description of the problem, your return address and a daytime phone number with all repairs. NOTE: DH150 decoders with circuit boards that are broken apart are not covered by our warranty. Please follow installation instructions carefully to avoid breaking the PCB.



## **Decoder Installation Instructions For DH150K In Kato HO-scale GP30/38 and Similar Locomotives**

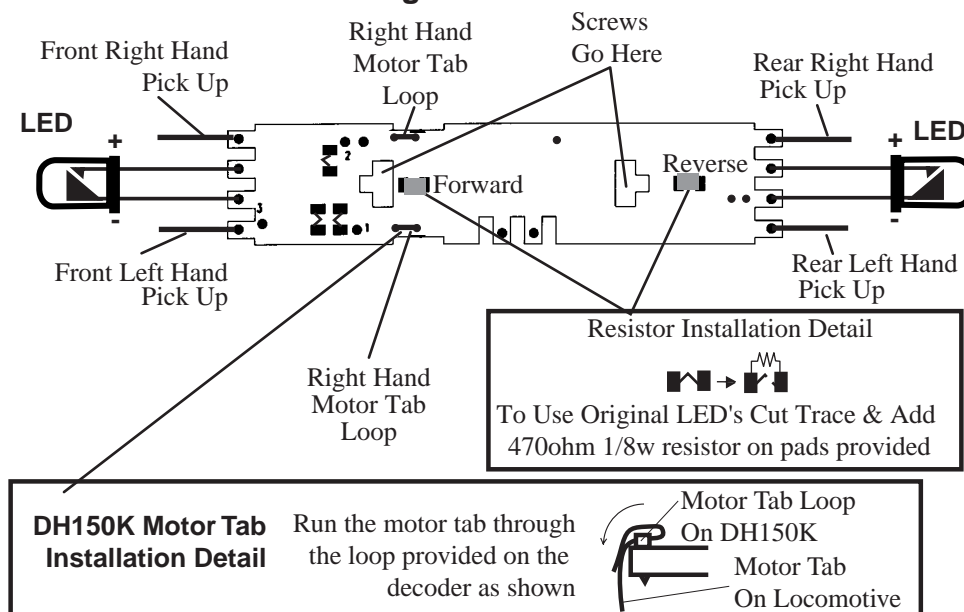
1. Remove locomotive shell. Remove the weight by unscrewing the screws on top of the weight and lifting it off.
2. Note the wire connections to the circuit board inside the locomotive.
3. Carefully disconnect the four pick up wires from the circuit board in the loco. Keep the metal crimps on the end of the wires intact .
4. Carefully disconnect the two motor tabs from the left and right sides of the board.
5. Remove the circuit board from the locomotive by unscrewing the screws that hold it in place and lifting up on the board.
6. Using a pair of diagonal cutters, nip off the two front center fingers on the decoder as indicated on the diagram. Gently file back the decoder board in the area where you removed the fingers so that the weight will fit over it. Be careful not to damage any traces on the decoder when you file the board. To prevent shorts on the decoder, apply two layers of thin tape to the non component side of the decoder board and wrap it around the front edge as indicated on the diagram.
7. Remove the 12V lamps from the locomotive's circuit board and install them on the non component side of the decoder board as shown. Be careful that the wires from the lamp are insulated and do not cause a short on the decoder board.
8. Be sure to install the decoder in the locomotive in the same motor pick up orientation as the circuit board you removed. The component side of the decoder will be facing down. Secure the decoder in place with the original screws. Before attaching the wires to the decoder be sure you are set up in the correct orientation.
9. If the decoder pick ups are too long and interfere with the replacement of the weight or shell, trim them to the proper length.
10. Attach the wires from the locomotive to the decoder as shown and use pliers to secure the metal wire crimps to the decoder pickups.
11. Loop the motor contact tabs through the motor tab loops on both sides of the decoder.
12. Before replacing the weight in the loco, place insulation tape on the weight near the lamps to prevent any contact that might cause a short when the weight is replaced.
13. Reinstall the weight by using the spacers & screws supplied with your decoder. See weight installation diagram. Be careful not overtighten the screws or damage the 12V lamps when you reinstall the weight.
14. Replace the locomotive's shell and you are ready to run with DCC!

## Digitrax DH150K Decoder Installation Instructions For DH150K In Kato HO-scale C44-9W & Similar Locomotives

1. Remove locomotive shell and weight.
2. Note the wire connections to the circuit board inside the locomotive.
3. Carefully disconnect the four pick up wires from the circuit board in the loco. Keep the metal crimps on the end of the wires intact .
4. Carefully disconnect the two motor tabs from the left and right sides of the board by removing the brass retaining clips.
5. Remove the circuit board from the locomotive by unscrewing the screws that hold it in place and lifting up on the board.
6. Remove the LED's from the locomotive's circuit board and install them on the decoder board as shown. Be sure to note the polarity of the LED's. The cathode (-ve) tab is the triangular "flag" inside the LED body as shown in the diagram.\*
7. Cut the traces as shown and install a 470ohm 1/8watt resistor on the pads provided.
8. Be sure to install the decoder in the locomotive in the same orientation as the circuit board you removed. The component side of the decoder will be facing down. Secure the decoder in place with the original screws. Before attaching the wires to the decoder be sure you are set up in the correct orientation.
9. If the decoder pick ups are too long and interfere with the replacement of the shell, trim them to the proper length.
10. Attach the track pickup wires from the locomotive to the decoder as shown and use pliers to secure the metal wire crimps to the decoder pickups by compressing them gently.
11. Loop the motor contact tabs through the motor tab loops on both sides of the decoder.
12. Replace the locomotive's shell and you are ready to run with DCC!

\* Note: If you choose to use 12V bulbs, you won't need to cut the trace and install the resistor. You can vary the brightness of the LED or 1.5V bulb in your particular installation by choosing a 1/4watt resistor with a value between 270 and 680 ohms.

### DH150K Installation Diagram Kato C44-9W & Similar Locos

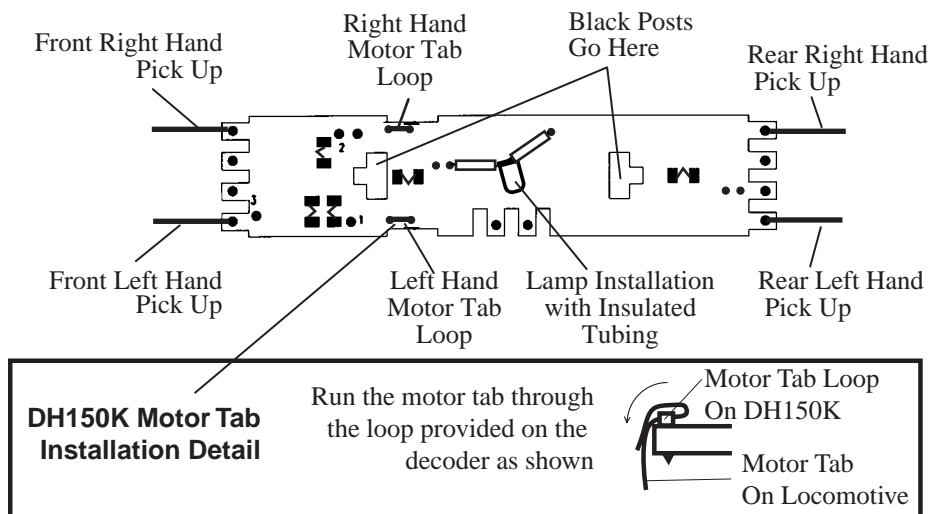




## Decoder Installation Instructions For DH150K In Atlas HO-scale RS1, RS3, C424, C425 & Similar Locomotives

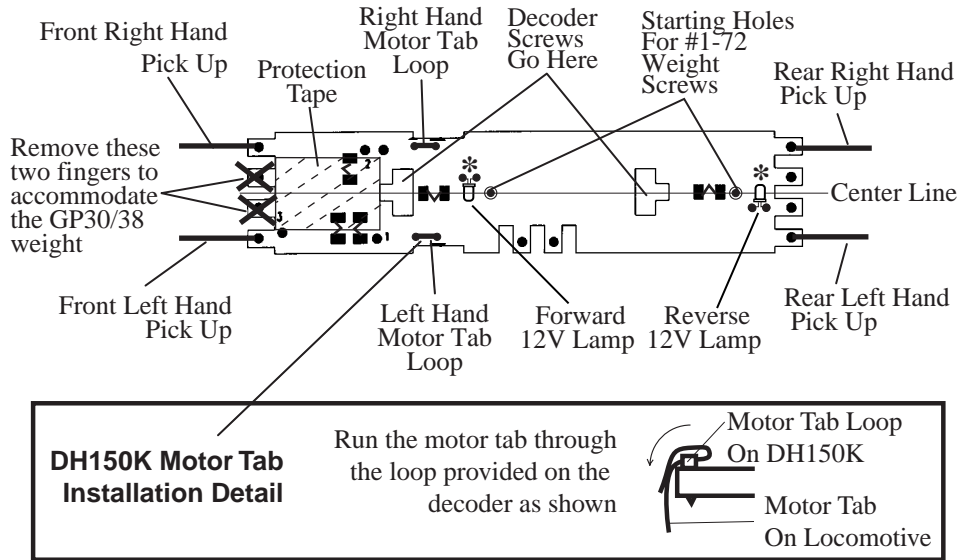
1. Remove locomotive shell.
2. Note the wire connections to the circuit board inside the locomotive.
3. Carefully disconnect the four pick up wires from the circuit board in the loco. Keep the metal crimps on the end of the wires intact .
4. Carefully disconnect the two motor tabs from the left and right sides of the board.
5. Remove the circuit board from the locomotive by lifting it up and pressing in on the two black posts near the center of the locomotive.
6. Remove the 12V lamp from the center of the locomotive's circuit board and install it on the non component side of the decoder board as shown. Use the insulated tubing provided with your DH150K to be sure that the wires from the lamp are insulated and do not create a short on the decoder board.
7. Be sure to install the decoder in the locomotive in the same motor pick up orientation as the circuit board you removed. The component side of the decoder will be facing down. Gently press the decoder down over the two black posts near the center of the locomotive. Before attaching the wires to the decoder be sure you are set up in the correct orientation.
8. If the decoder pick ups are too long and interfere with the replacement of the shell, trim them to the proper length. On longer light board versions such as the Baldwin AS16 & F3 & F7 you will have to extend the track pickups to reach the decoder by adding a short length of wire.
9. Attach the pickup wires from the locomotive to the decoder as shown and use pliers to secure the metal wire crimps to the decoder pickups.
10. Loop the motor contact tabs through the motor tab loops on both sides of the decoder.
11. Replace the locomotive's shell and you are ready to run with DCC!

### DH150K Installation Diagram Atlas HO Scale RS1, RS3, C424, C425 & Similar Locomotives



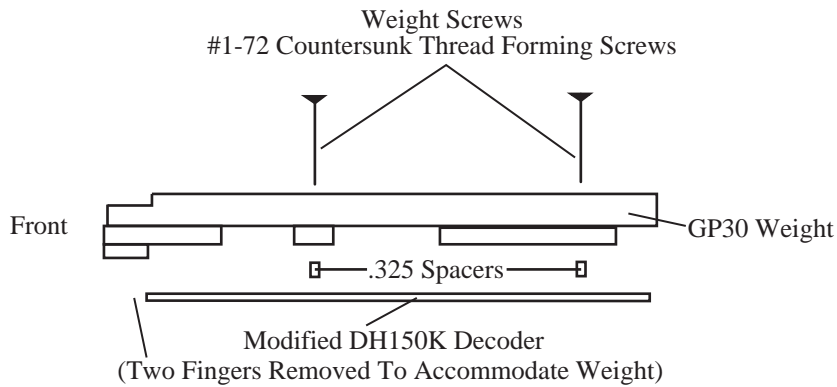
## DH150K Installation Diagram

### Kato HO GP30/38 and Similar Locomotives



- \* Insulate this area carefully to avoid shorting to the board and weight when the weight is replaced. We recommend putting insulation tape on the bottom of the weight and also on the lamp leads.

## GP30/38 Weight Installation Diagram



### Weight Installation Notes:

1. The decoder should not bend when the weight is replaced.
2. Don't forget the spacers!
3. Be sure the lamps are installed along the center line of the decoder and that they are not crushed or damaged when the weight is re-installed.
3. Do not over tighten the weight screws to avoid damage to the decoder and the lamps.

## Using Function Outputs on the DH150A & DH150K

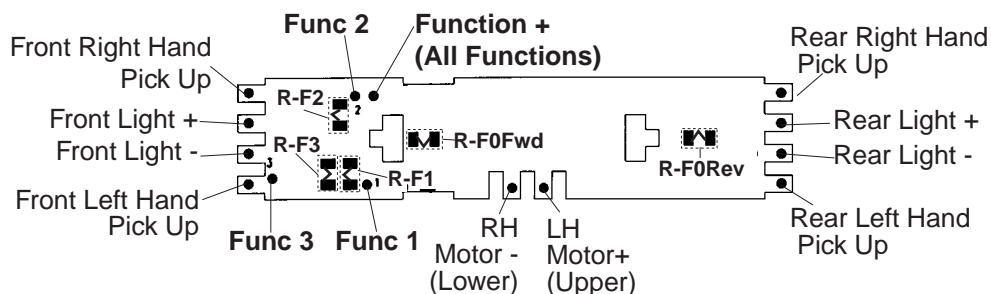
DH150 has 5 function outputs available. These function outputs are set up for 12V operation, please review your decoder manual for instructions about using other voltages. F0-Forward and F0-Reverse are set up at the factory for automatic reversing operation. If you wish to control these lights separately from your throttle, simply program CV61 to 01 and F0-reverse will run on F4 as an independent non-directional function and F0-forward will be non-directional.

Functions 1, 2 & 3 are also available on the DH150. If you wish to use these functions you will need to solder wires to the pads indicated Func 1, Func 2 & Func 3, then run the wires to the lights or other functions you wish to control. Please check the decoder manual section on lamp wiring if you are using 1.5V lamps or LED's. Current setting resistors are needed for these applications. Pads are provided on the decoder board for surface mount resistors. R-F1 are the resistor pads for Func 1, R-F2 are the resistor pads for Func 2 and so on. If you use 1.5V lamps or LED's for forward & reverse headlights, you can use the pads R-F0Fwd & R-F0Rev to install the required resistors. The pads are laid out for 1206 size surface mount resistors. If you choose to use axial resistors you can solder directly to the pads or solder & heat shrink them in the leads for the lamp. For function devices with a definite polarity like LED's the +ve leads connect to the Function + pad on the decoder.

To install resistors on the pads provided just cut the "chevron" trace that joins the two pads and solder the resistor directly to the pads.

Surface mount & axial resistors can be purchased from Digi-Key (1-800-DIGIKEY or [www.digikey.com](http://www.digikey.com)) or Radio Shack. For 1.5V lamps, we recommend 560ohm 1/4watt for GOR bulbs & 250ohm 1/4watt for GOW bulbs. Lower resistance values will increase the lamp brightness, minimum value is 100 ohms.

F0 Fwd, F0 Rev, F1 & F2 can be set up with Digitrax Real FX™ features. See your Digitrax Decoder Manual for complete instructions for setting up these special lighting effects.



## **Digitrax DH150A & DH150K**

There are many other locomotives that use circuit boards that are very similar to the circuit board in the Atlas U33C. We offer the DH150A and it's sister the DH150K to fit many different locomotives. Actually DH150A & DH150K are the same decoder, the "K" version is optimized for motor tabs & track pickups and comes with various spacers, screws and other hardware that makes these installations simpler for you.

Note that the DH150K lets you customize the lighting for each locomotive.

This supplement to our decoder manual details how to install the DH150K in the locomotives listed below. The DH150K is a replacement board for the PCB that comes preinstalled in these locomotives. You won't need to solder to hook up the pick ups or the motor leads and you won't need to make modifications to the locomotive or it's weights to make room for the decoder. The only soldering needed is related to lamp installation. Because of the variety of lamps used and the different physical arrangements of the various locomotives, this small amount of soldering couldn't easily be eliminated from the installation process.

**DH150A Fits Atlas U33C & U36C. This is a no solder installation.**

**DH150K Is Optimized To Fit Atlas RS1, RS3, C424, C425, GP7, RSD4/5, RSD12, C30-7, Kato GP35, SD40, C44-9W, Stewart RS11, F3A, F3B, F7A, F7B, F9A, F9B , U25C, Baldwin AS16 and others. These installations require a small amount of soldering for lighting.**

NOTE: These decoders also fit other locomotives not mentioned above. Many locomotives were based on the Kato OEM drive mechanism that this decoder was designed for. E&C Shops next upcoming locomotive is designed with the same circuit board.

**See Digitrax Decoder Users Manual for complete decoder test procedures, installation instructions & technical information. This manual is available at no charge from your dealer. If your dealer is out of these manuals, contact Digitrax (770) 441-7992, Fax (770) 441-0759, or e-mail [sales@digitrax.com](mailto:sales@digitrax.com) and we will gladly send you a copy. The complete Digitrax Decoder Manual is also available on the web through our web site [www.digitrax.com](http://www.digitrax.com).**

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