

Atlas MP15 DC Switcher **Tsunami2 2200 PNP BCH151**

The Atlas MP15 DC switcher is a perfect choice for adding sound. The model is well detailed and it's motor is of high quality and very smooth running. The most challenging aspects of this decoder installation for me were removing the shell, and placing the speaker!



I wanted to also add a Stay Alive capacitor and because this model is a switcher, room under the shell is at a premium. Some compromises have to be made. For example, the only space I could find for the capacitor was in the cab. This meant either the people and instrument detail in the cab stayed with no stay alive, or the people had to go to accommodate placing the capacitor in the cab. I elected for

Atlas MP15 DC Switcher [Tsunami2 2200 PNP](#)

(Note: Double tapping photos in iOS PDF files will enlarge photo)

functional operability. As I wanted the best possible sound, I chose an Oval speaker from SoundTraxx .. the smallest oval speaker they supply. This caused a little more work doing the installation, but in the end produced high quality audio. The SoundTraxx Tsunami2 2200 PNP decoder is a good choice for this application, but because of space constraints I was unable to take advantage of all 6 function outputs available....no rotary beacon or flashing Ditchlights as is my usual custom.

Here is the parts list:

- SoundTraxx Tsunami2 TSU-PNP Decoder
- TCS KA-1 Keep Alive capacitor
- SoundTraxx Oval Speaker PN 810112 25mm x 14mm x 5.2mm 1.5 watts 8 ohms and gaskets
- SMD Surface Mount resistors. 1.8K Ohms X 2
- 30 AWG Colour coded wire
- Kapton tape and heat shrink tubing
- Connector leads with plug to adapt the TCS Keep Alive to the Current Keeper decoder plug

I used the original LEDs supplied with the model.

Considerable care must be taken in removing the shell. There are very tight tolerances, perhaps enhanced on my model because of its special paint décor? First remove the front and rear couplers and gear boxes. Remove the plastic fuel tank from the frame by pulling down on the fuel tank. Grab the part of the frame from which you removed the fuel tank with one hand, and grab the cab with your other hand. Watch where you put your fingers so that you don't break the handrails and other small detail parts. From the cab end gently work the shell up, Go to the front end and do the same. Note that the

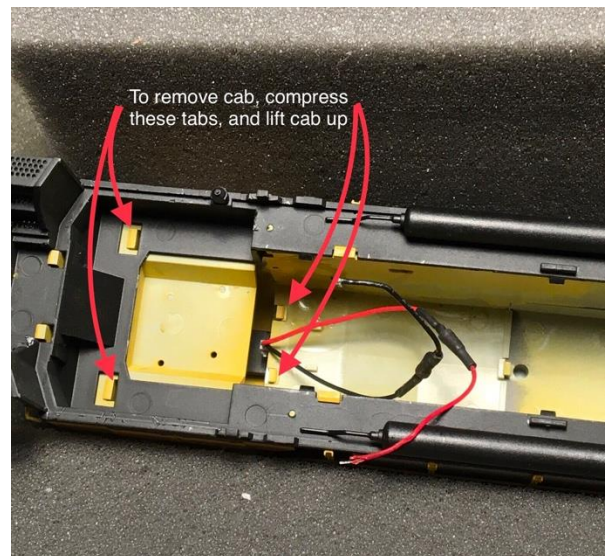


LEDs are connected to the light board and these wires must be disconnected via their plugs before lifting the shell off.

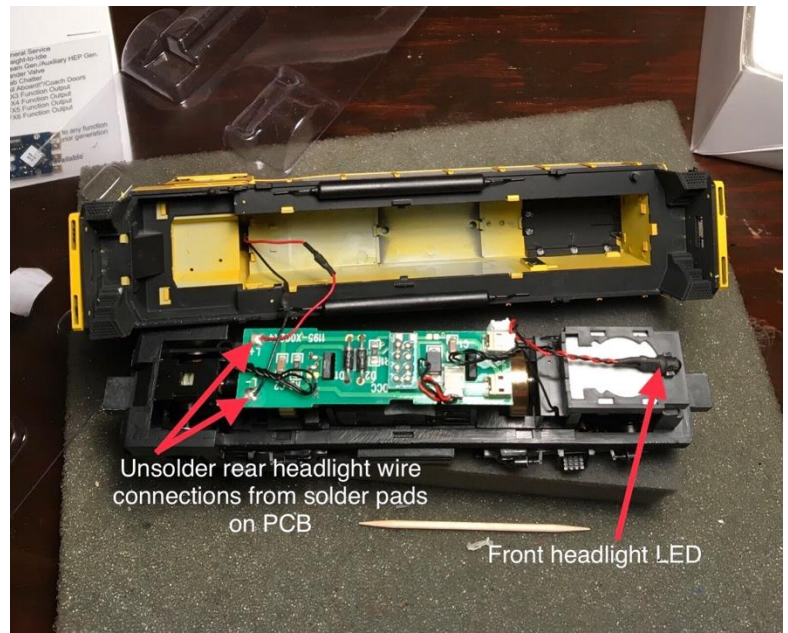
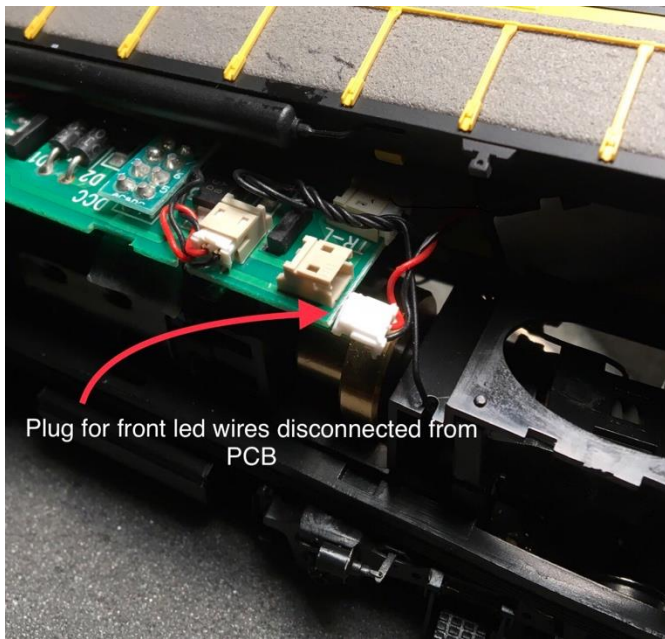
The front LED headlight may also come off in this process. Work slowly and carefully doing this. My personal experience was that one of the vertical supports for the Front LED assembly broke during removal. I also experienced a fracture of the front end of the chassis frame when placing the shell back on. I corrected this with some Cyanoacrylate glue. I also used an Exacto knife to shave off some of the inside edges of the running boards and shell to relieve some pressure off the tight 'friction fit'. Since the Keep Alive is to be placed in the cab, careful removal of the cab is also necessary. See photos showing where to disconnect the fragile railings prior to cab removal.



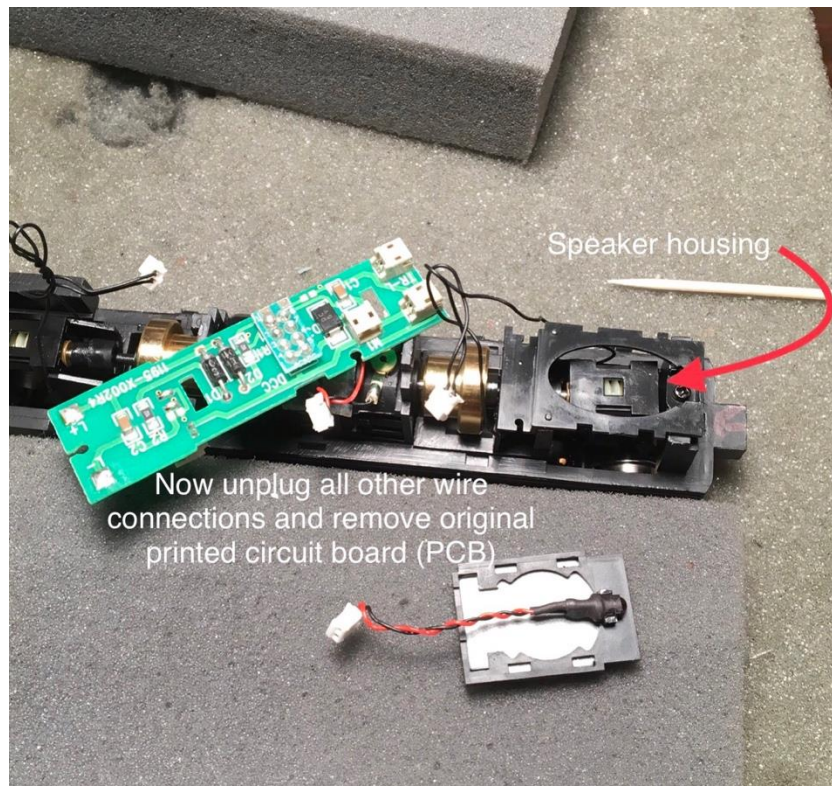
Carefully remove railings prior to cab removal



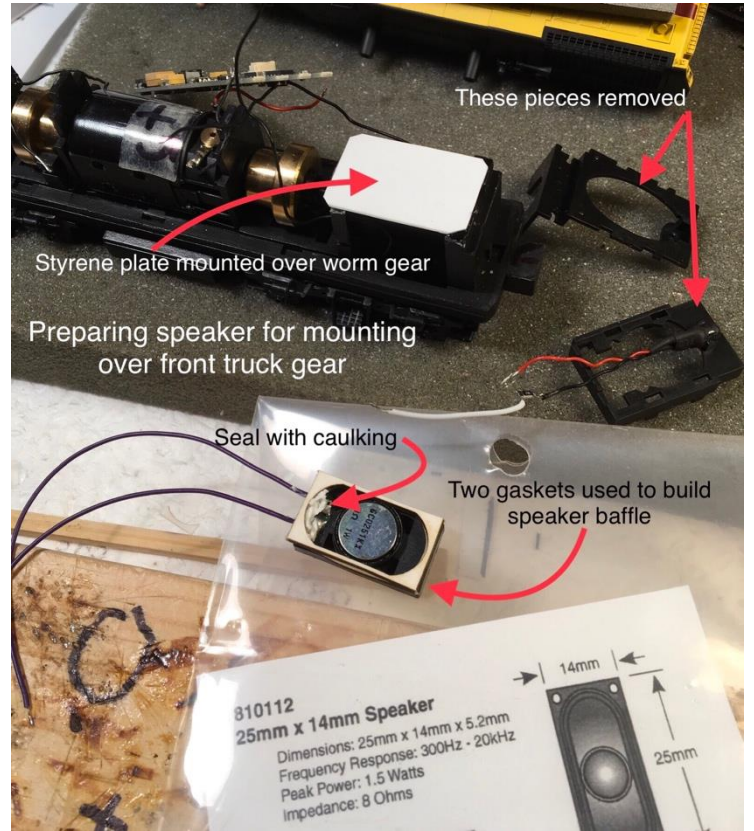
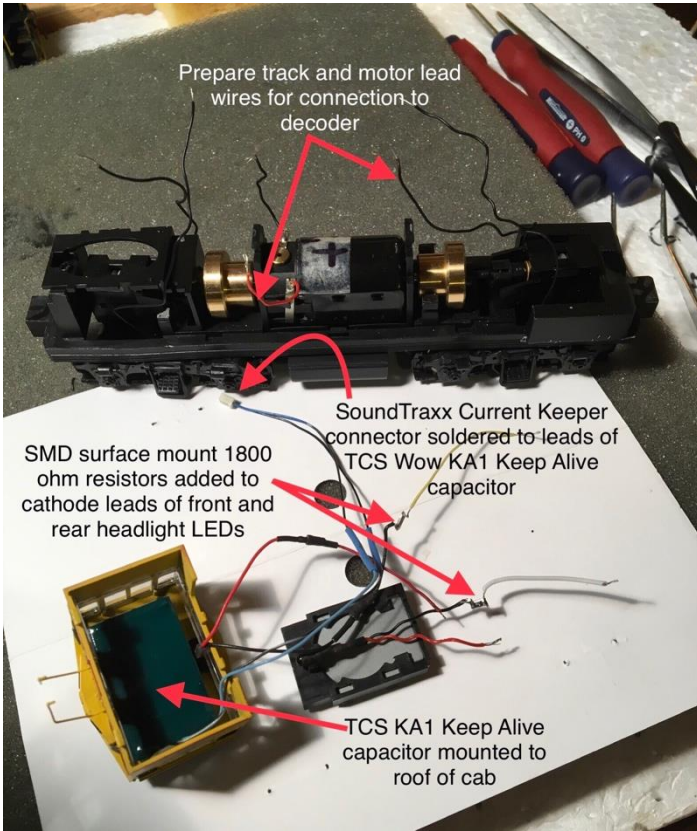
After finally removing the shell this is what you see under the hood!



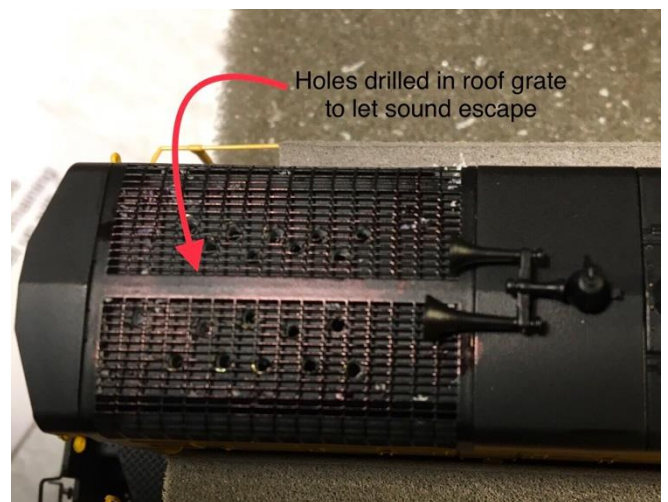
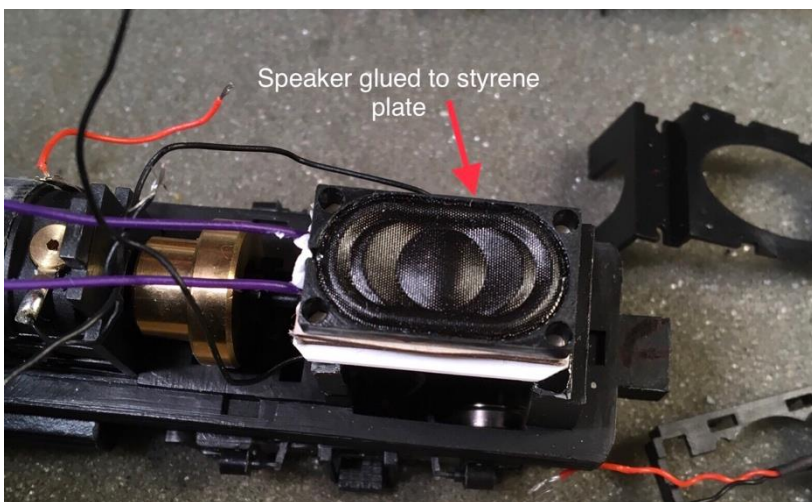
To accommodate the oval speaker I removed the plastic front LED support structure, including the front weight. I secured the front headlight LED to the roof of the shell. Unsolder the rear headlight wire connections and remove the original PCB lightboard.



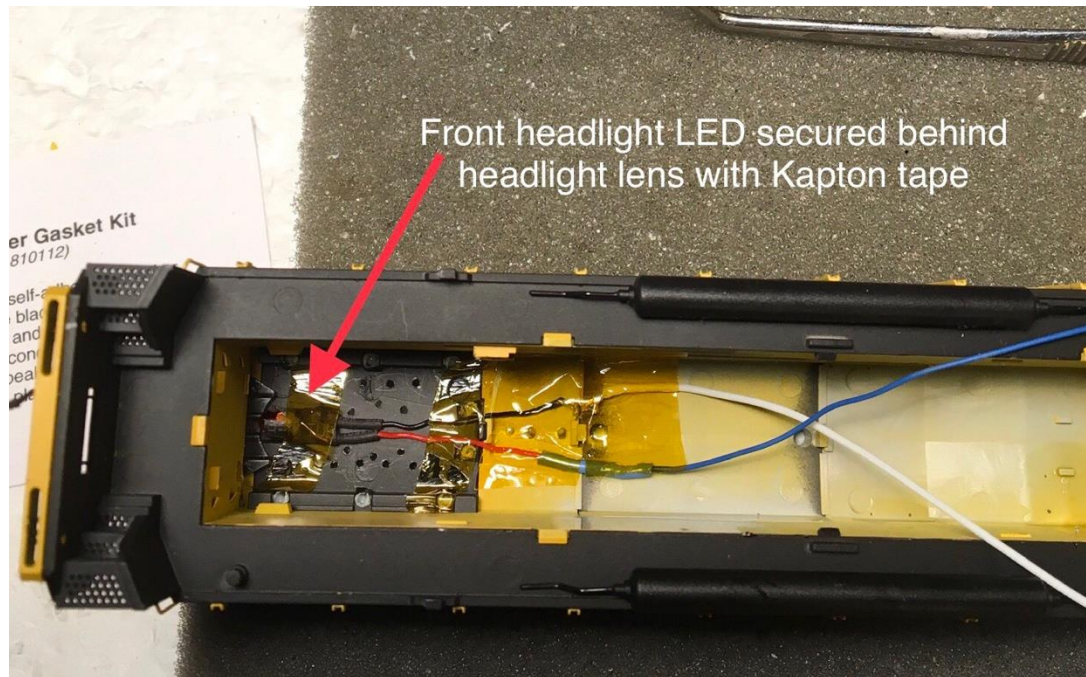
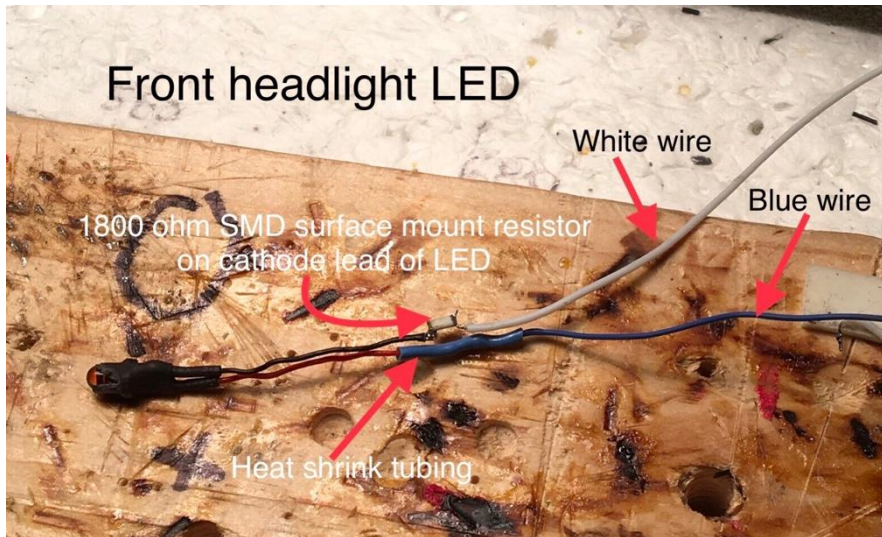
The Keep Alive is mounted to the roof of the cab using double sided sticky tape, and SMD surface mount resistors are soldered to the cathode leads of the front and rear LED headlights. The speaker is mounted above the front truck, to a styrene plate glued to the vertical supports of the chassis. The original plastic speaker housing has been discarded.



Holes are drilled into the roof of the front grill to let the sound out.

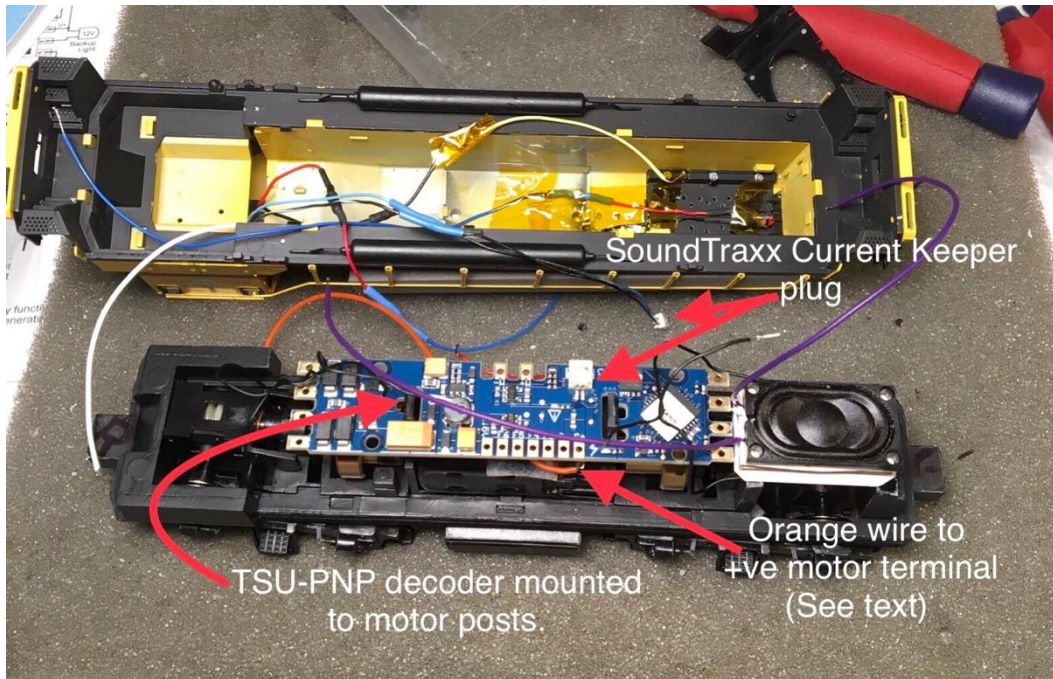


More details of the front headlight LED:

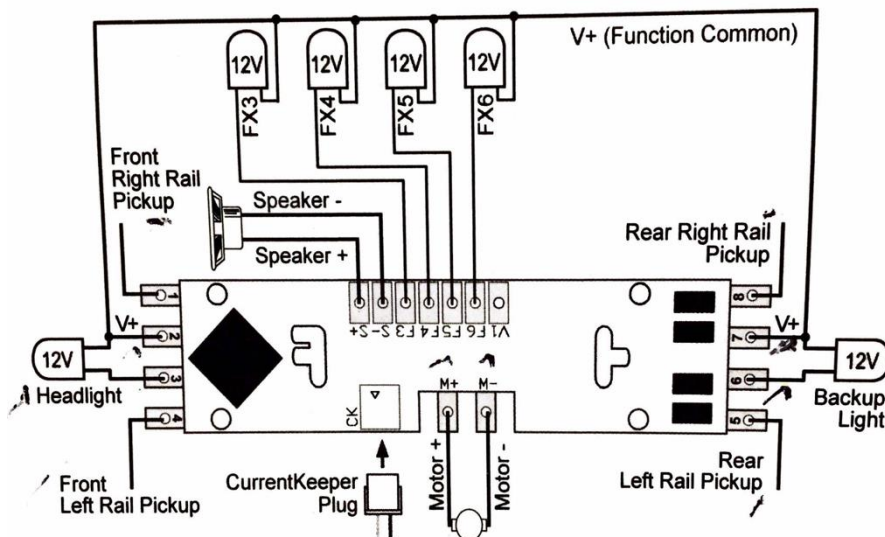


After mounting the decoder we are now ready to make the solder connections to the appropriate solder pads. See the wiring schematic on page 7.
Note also that using a TCS KA-1 Keep Alive required connecting a SoundTraxx Current Keeper plug to the KA-1. These Current Keeper connectors are available from SoundTraxx. I obtained mine by sacrificing the connector from a SoundTraxx Current Keeper I already had. If there had been room in the cab for the larger SoundTraxx Current Keeper I would have used it.

This is what it looks like before and after the connections are made.



As mentioned at the beginning of the article, extreme care is in order to replace the shell. I had to shave some of the edges of the inside of the shell to facilitate ease of replacement.



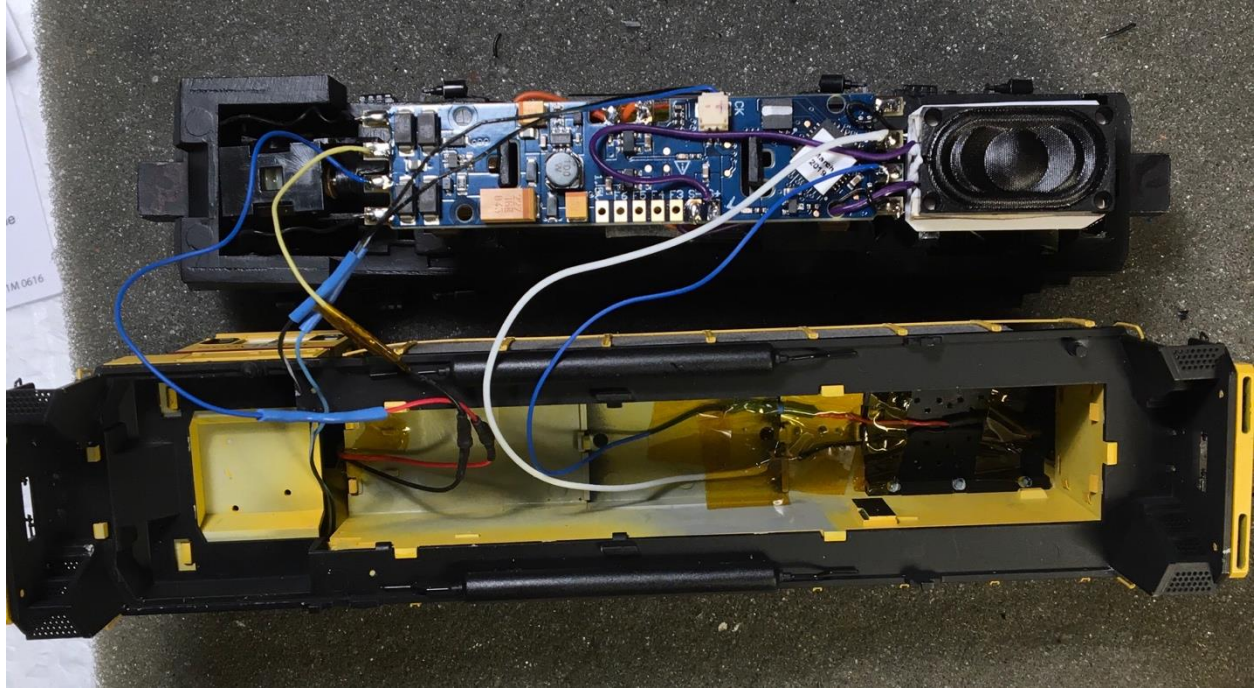
Note: This wiring diagram is for use with 12V lights. When using 1.5V incandescent bulbs, connect one lead to the 1.5V Common terminal (V1) and the other to its respective function terminal. Refer to *Technical Notes 17 & 18* for 1.5V bulb and LED wiring diagrams. The TSU-PNP includes a quick-plug for an optional CurrentKeeper (P.N. 810140) to maintain performance during momentary power losses.

Wiring schematic of TSU-PNP courtesy of SoundTraxx

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(Note: Double tapping photos in iOS PDF files will enlarge photo)

Check polarity of the motor terminals prior to making solder connections!



Now time to program some CVs!



BC Hydro BCH151 Atlas MP15 DC Switcher Tsunami2 2200 PNP

Install Date: Oct 26 2019. CVs programmed Oct 28 2019 using NCE PH Pro 5 amp command station.

Manufacture: 141
Decoder version: 071
Address: Long 0151 Short 3 Long address activated
DC mode disabled
Set up Config:
 Direction bit = normal
 Speed steps equal 28
 Speed table standard
CV 2 Start Voltage 0
CV 6 Mid voltage 128
CV 5 Max Voltage 255
Acceleration 75
Deceleration 75

CV 114: Engine Exhaust Control

Description:

CV 114 is used to adjust the auto-notching sensitivity level, enable engine interlock, enable auto-start, and select from four dynamic braking modes.

(Default value = 39)

Set to 47 for **calibrating DDE**

I did not personally calibrate the motor on this Atlas MP15. It appears to have already been done by the hobby store owner. I purchased it 'new' .. non DCC model.. from the retired store owner at the Victoria train show for \$100

Note: You cannot program indexed CVs (CVs 257 – 512) on programming track with NCE PH Pro 5 Amp. Must use Program on Main to write values to these CVs.

Also Note PH Pro 5 Amp: You CANNOT read CVs from the programming track using the radio control wireless mode. You must be directly tethered to the power bus of the control station in order to be able to READ CVs on the programming track.

See Tsunami2 User Guide page 53

If you are using the NCE Pro Cab to read any CV in the range 257-1024 (this happens to include the indexed CVs since they are in the range 257-512), you can safely press ENTER ****provided**** **you do not change the displayed value**, to move on to the next CV.

From Soundtraxx forums.

There are two types of DDE and one is already active on the TSU 2: From Justin at Soundtraxx :

Note from Tech Support at SoundTraxx:

"There are two types of Dynamic Digital Exhaust on our products, Active and Passive. By default, only the Passive DDE is enabled. The active DDE uses the motor feedback and the Passive DDE uses your command station's speed step setting. (Throttle). To disable it program CV2.511 = 0."

So, as is, the TSU 2 produces a DDE effect (passive) as a default feature.

CV 32 = 2 (change to page 2 of indexed CVs)

CV 512 = 16

Calibrate CVs 503 and 504 = 255. See manual for instructions.

CV 512 and CV 511 set to 255

CV 2.507 = 255 Default Value = 0 (Prime Mover) (0) Note at 0 there was no DDE sound effect.

Setting at 255 produced lots of DDE sound effect! (-12db) See Tech Reference Manual pg 125.

CV 2.508 = 255 Default Value = 255

CV 2.509 = 215 Default Value = 215. (Time) 0=instant response

CV 2.510 = 215 Default Value = 215

CV 2.511 = 255 Default Value = 10. (Throttle Sensitivity)

(a value of 0 into CV 2.511 will disable DDE throttle sensing)

CV 2.512 = 255 Default Value = 0. (Load Sensitivity) Experiment with this value

Entering a value of 0 into CV 2.512 will disable DDE load sensing and sound effects will not be modified when the motor is impeded. Setting CV 2.512 to 255 indicates that the prime mover sound effect will be most sensitive to changes in motor load.

Reading these CVs from factory settings:

CV 114 = 39 (factory default)

As CVs 503 and 504 were already set I did not calibrate these CVs as per steps 7-8 in manual.

CV 32 = 1 (Index page number)

Set CV 32 to 2 to read CVs 2.xxx (page 2)

CV 512 = 0 Factory default. (Load sensitivity)

CV 512 changed to 16 ... then 128 .. then 64 .. 32. Best at and set to 64 Oct 29 2019.

CV 511 = 10 Throttle sensitivity..left at default 10

CV 503 = 60

CV 504 = 150

CV 507 = 0 (Low volume limit ..max volume decrease at low speed)

CV 508 = 255 (High volume limit .. max volume increase at high speed)

CV 509 = 215

CV 510 = 215

CV 217 (Motor Control Register) Auto Stop and Back EMF Enable: Value from factory = 10

Current value of CV 211 = 180 .. default factory setting !

Current value of CV 212 = 255

Independent Brake CV settings

CV 117- 140 (manual suggests 178) Independent Brake

CV 118- 100 Train Brake. Manual suggests value of 100 for more gradual braking rate for Train Brake.

Turning on F12, the brake select function, (to turn ON the Train Brake) will cycle the air compressor to simulate charging the train line

CV 116 - 140 Dynamic Brake.

To apply brakes to maintain speed, apply dynamic brakes with the dynamic brake function (F4 by default).

Manual suggests value of 60 for a gradual braking rate. Applying dynamic brakes will not bring the locomotive to a stop.

Note: When consisting with active momentum and braking rates, ensure the values of CVs 3, 4, 116, 117, and 118 are the same for all units.

Function mapping Changed Dimmer to F11 and Braking to F7 on Oct 30 2019

Used Decoder Pro to change function button 7 from Dimmer to Independent or Train Brake for locomotive.. Used Function Mapping Screen. These CVs are indexed (CV 1.273) so have to use Program on Main because NCE PH Pro 5 Amp with Pro Cab does not allow writing to indexed CVs on the Programming track. So before going to the BCH151 file, change Decoder Pro to Program on Main. Note also that the toggle switch for program track versus programming on main for the Hillside siding has to be thrown to program on main. NOTE: NEVER CROSS ONTO HILLSIDE SIDING TRACK FROM MAIN WITH THE PROGRAM TRACK TOGGLE SWITCH SET TO (UP) (PROGRAM TRACK)....because this can send main DCC power to the Command Stations Program track output connector as the loco crosses the insulator gaps, and fry your Command Station!!!

Enabling Automatic Effects

1. Ensure CV 31 is set to a value of 16. (Default...don't change)
2. Enter a value of 1 into CV 32. (Page index)
3. Access CVs 385-512 from your command station and refer to the descriptions and CV values below to enable automatic effects

CV 1.407: **Forward Whistle** Signal Default: 0?

1 = Effect active when moving in forward direction

CV 1.407 = 1 Oct 31 2019

Set bit 1 of CV 1.408 to 1 by adding 2 to CV 1.408 which will turn on the **reverse whistle** when loco starts up in reverse.

CV 1.408 = 2 Oct 31 2019

CV 1.409 = 12 Oct 31 2019

Set these CVs to 0 to disable auto effects.

CV 1.409: **Stop Whistle Signal**. Default: 0

Added value of 12 to the Stop whistle signal to set bit 2 FWDS Forward-Standing (add value of 4) and set bit 3 REVS Reverse-Standing on by adding value of 8 so total value put in CV 1.409 = 12, to have Stop whistle blow automatically on stopping either from forward or reverse

Motor control CVs

CV 209 = 48. (Default) Kp Coefficient

CV 210 = 16....try 25 or 30? (25) Ki Coefficient affects DDE. No effect change. Original =16

CV 211 = ? (default)(Slow Speed Compensation) Low Speed compensation

setting CV 211 to the lowest value that will still improve low-speed operation. Default Value = 180.

CV 211=180 (Date: Oct 31 2019)

CV 215 = 150 .. Oct 31 2019 (Back EMF Reference Voltage Default = 150) ...for track voltage of 12 Volts..set to 120. See manual.

Left at default value 150 Oct 31 2019

CV 216 = 0

CV 217 = 10 (BEMF Enable - Auto-Stop Enable)

CV 218 and 219 = 15



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