

## Tsunami 2 Decoder installation into Kato HO EMD SD40-2

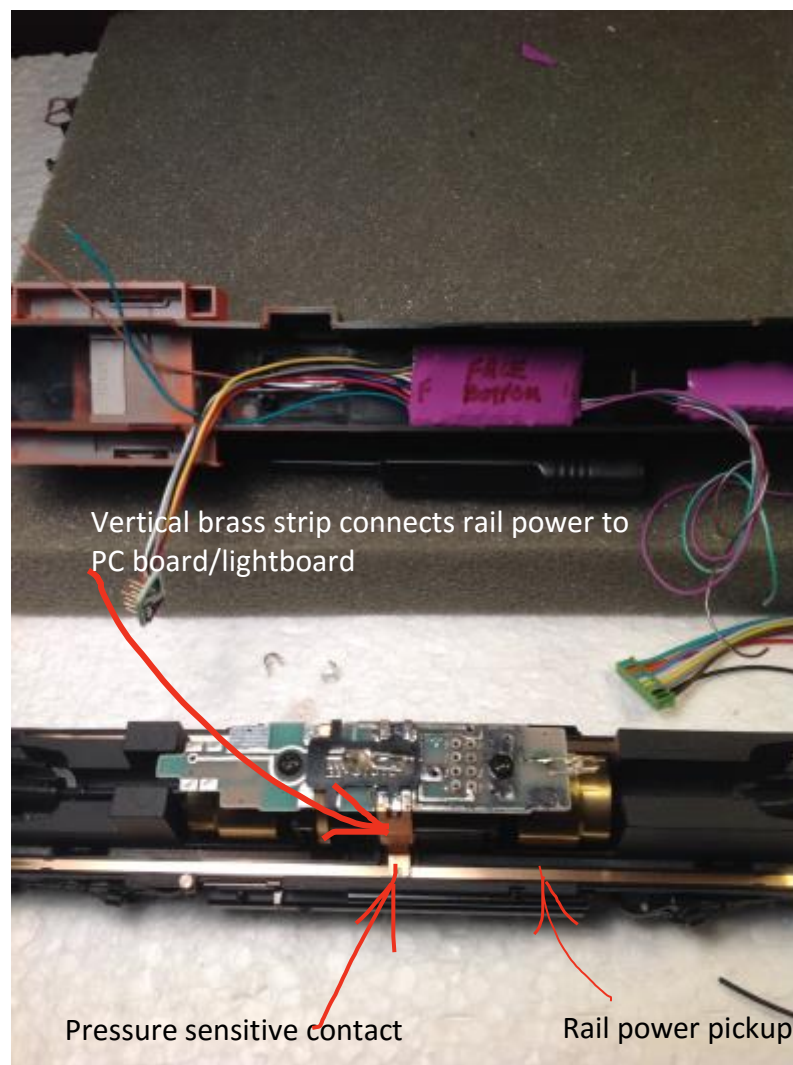
Date: August 7 2016.

(Photo of Kato SD40-2)

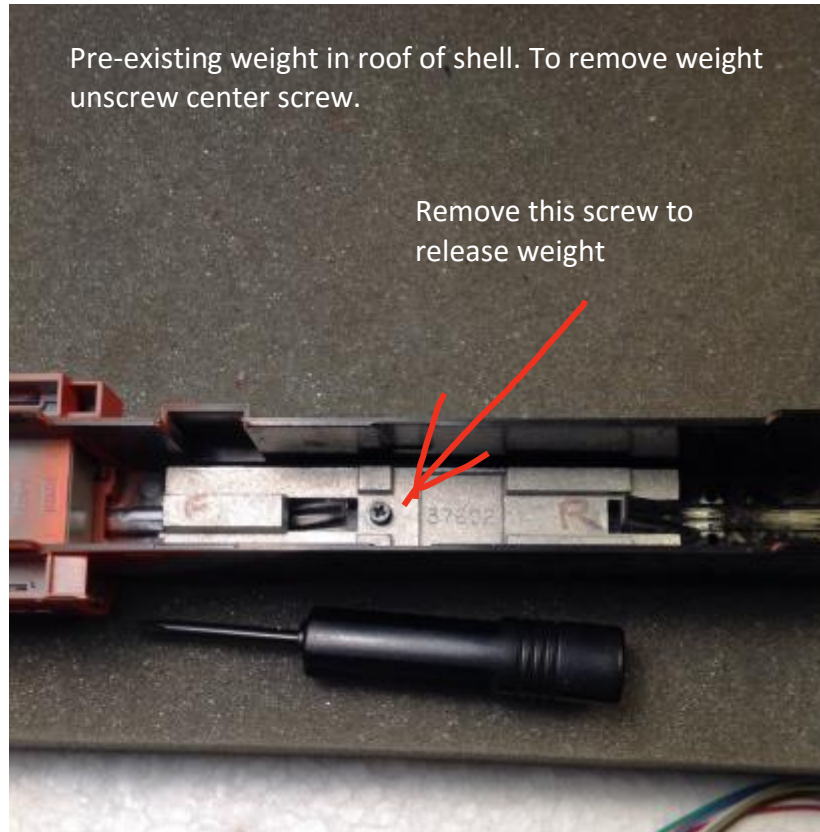
The Kato HO SD40-2 locomotive runs well and is suitably weighted to pull long consists. It's electric motor is smooth and warrants the effort of installing a decoder.

This particular model has great detail, a smooth running 5 pole can motor, and in addition comes DCC ready for decoder installation. This means there is a pre-installed 8 pin DCC plug. This model is one of the Kato originals, meaning well built, but with a long brass strip on each side of the chassis for electrical pickup from right and left rails. Power is then fed to the printed circuit board/lightboard by a vertical brass strip which makes contact with the long brass strips picking up power from the rails relying on the bent angle end of the vertical brass strip going to the lightboard making contact by pressure touch. Thus this particular locomotive was sensitive to electrical continuity issues. This model is therefore the perfect candidate for a Tsunami 2 and Current Keeper installation.

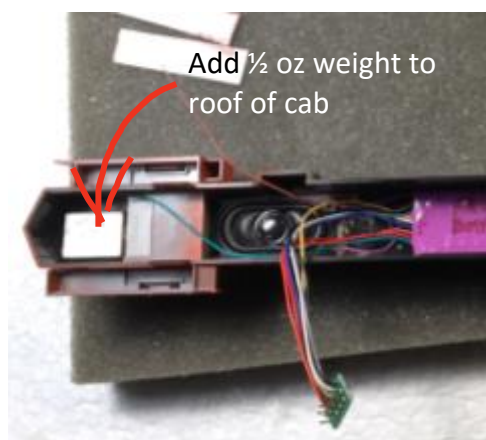
**(Chassis of Kato SD40-2 without shell showing vertical brass electrical connectors)**



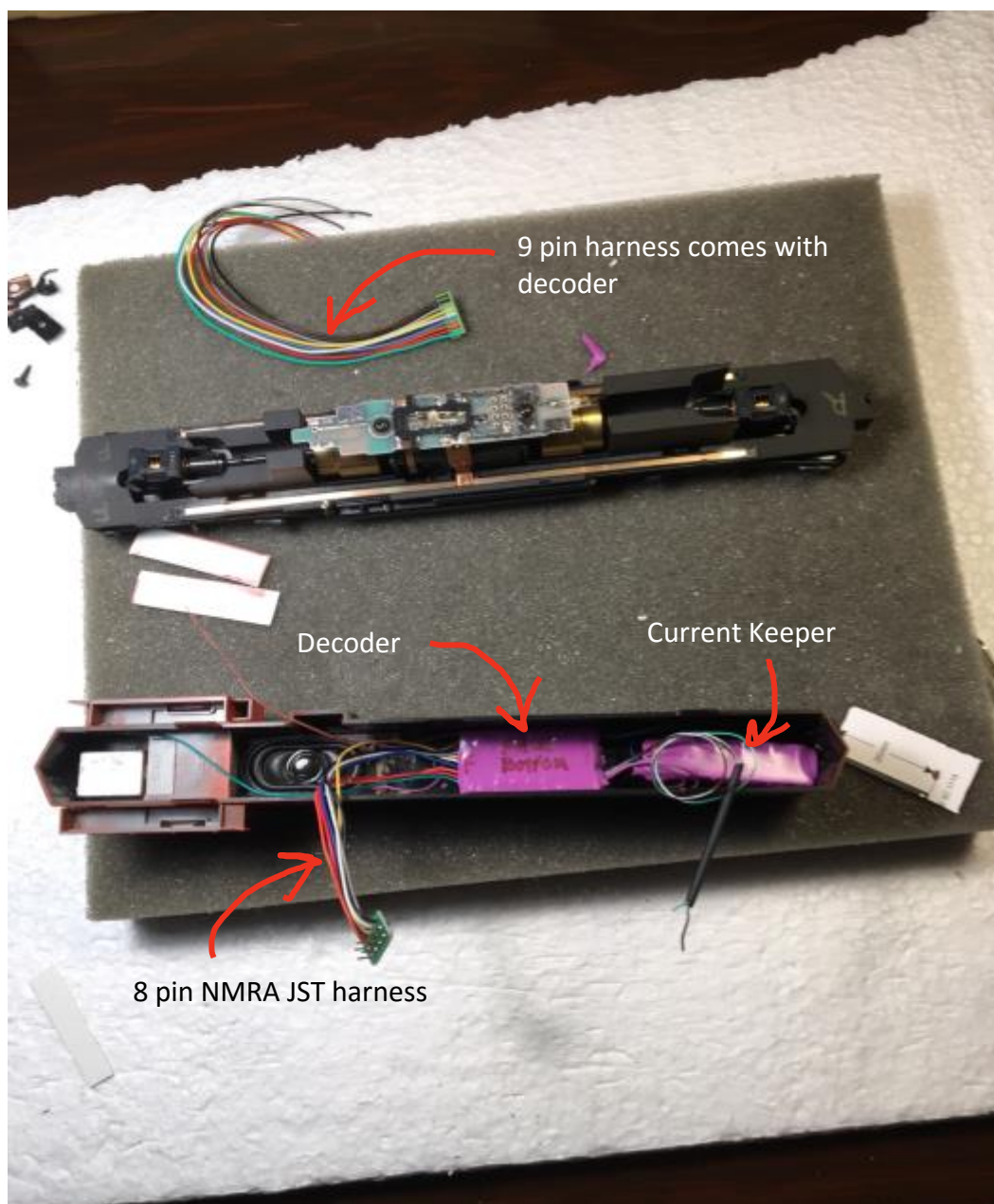
**(Photo of weight)**

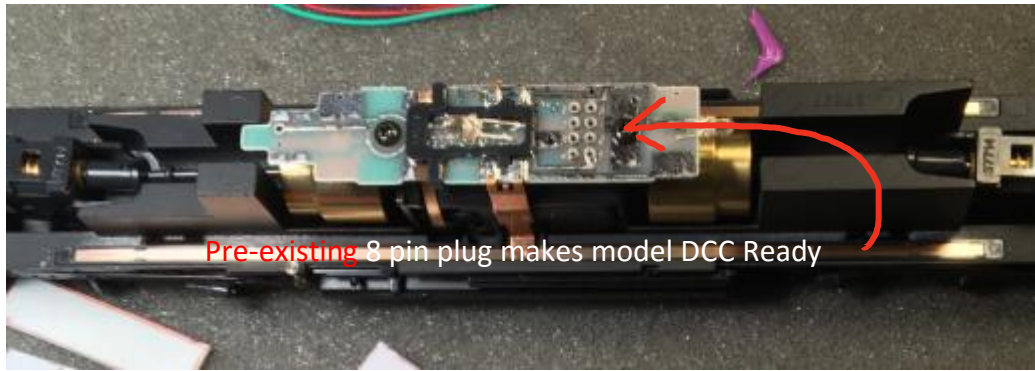


Removal of the long weight in the top of the shell is necessary to make room for the decoder, speaker, and current keeper. (Unscrew the single black screw in the center of the weight to remove weight.) Some of this weight is recovered by adding a 1/2 oz weight to the roof of the shell in the forward short hood using double sided sticky foam tape.



Removal of the weight at top of long hood makes room for decoder and current keeper and speaker. Since the Kato SD40-2 is DCC ready, and has an 8 pin plug on the preexisting light board, I therefore decided to leave the original surface mount LED's and light tubes in place. The voltage across the LED leads with the locomotive on a DC powered track measures about 3 volts at max DC 12-14 volts power, confirming there is a preexisting limiting resistor on the circuit board. Exchange the 9 pin wire harness that comes with the decoder for a 9 pin to 8 pin NMRA JST wiring harness from SoundTraxx part number.. 810135.

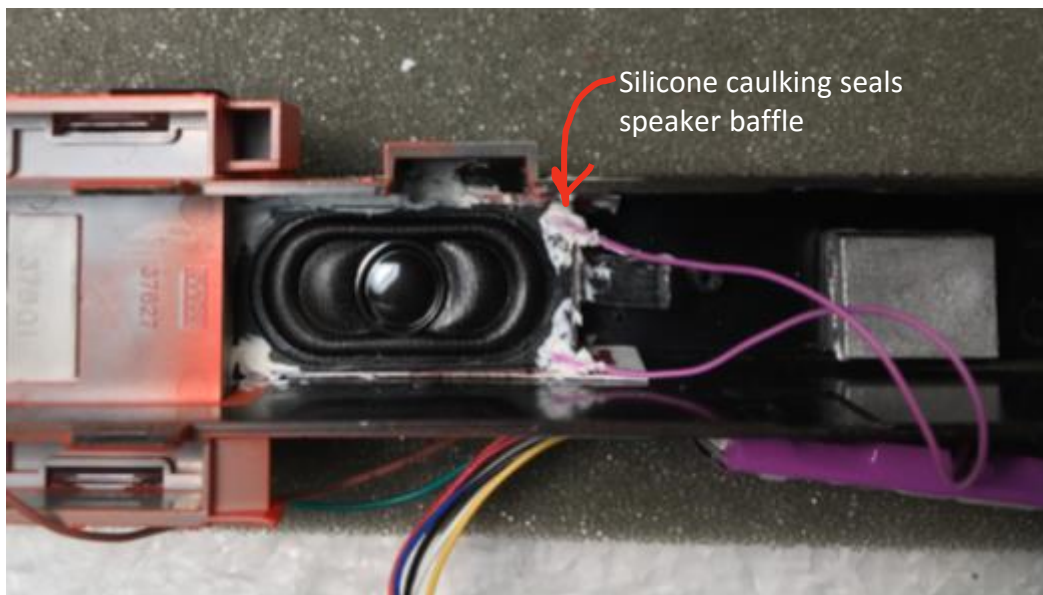




**Photo of lightboard**

To do this you have to carefully trim some of the shrink wrap from the end of the Tsunami 2 using an Exacto knife, to expose enough of the 9 pin plug and socket on the decoder to allow its removal. Grab all 9 wires and gently wiggle the female connector plug out of the socket on the decoder. Hold the socket onto the decoder's PC board while doing this or gently pry the plug from the socket with an Exacto knife so as not to dislodge the socket from the PC board of the decoder. Now insert the 9 pin to 8 pin harness making sure the alignment slots are correct. This takes some pressure to be sure the plug is all the way in. When plugging the 8 pin connector into the SD40-2's lightboard plug be sure the pins are correctly aligned with the Orange wire of pin 1 at the top left when looking down on the lightboard.

Prior to plugging in the decoder to the SD40-2 lightboard I soldered the purple speaker leads to the speaker. In addition it is necessary to build a speaker baffle onto which you can mount the speaker. The baffle essentially blocks sound waves exiting the back of the speaker from cancelling the sound waves released from the front of the speaker.



**(Photo of speaker and baffle assembled into the roof of the shell just behind the cab)**

The speaker is placed into the top of the long hood immediately behind the cab, resting on the front headlight light bar. I built a speaker baffle using styrene sheets of appropriate thickness to snugly fit the speaker into the long hood shell. Use cyanoacrylate glue and silicone sealant to insure no sound leakage from the baffle. This includes caulking the 4 holes in the speaker casing.

Trim some of the shrink wrap off both ends of Current Keeper to allow it to fit in top of the Long hood, mounted on the rear light bar. Be careful doing this. For me this proved costly as I inadvertently cut the black wire from the plug at the Current Keeper necessitating a replacement 2 pin connector for the Current Keeper. Plug the connector into the appropriate socket on the Tsunami 2 decoder as per SoundTraxx instructions. Use double sided foam tape to mount the Current Keeper into the top rear of the long hood shell.

Secure the decoder into the top of the shell previously occupied by the weight using double sided foam tape. The location of the decoder above the motor is not ideal because of heat build up so try to provide as much air flow circulation as possible. If this proves to be an issue I will drill some small ventilation holes in the top of the shell through the ventilation ducts. To help compensate for the loss of the original weight I added a 1/2 oz weight to the roof of the front hood. Secure this with double sided tape. (See photo of added weight above)

It might be possible to add a second weight on the roof of the long hood. (On trying this I found it difficult to replace the shell and therefore ignored doing this step) Use double sided foam tape to secure the Current Keeper to the roof of the Long Hood.I,

When reassembling clear the wires to the sides of the light bars and tuck the wires above the light bars and as close to the roof of the shell as possible. Prior to plugging in the 8 pin plug from the decoder, be sure you have the perimeter companion walk way installed on the locomotive chassis as you will not be able to fit it after you have plugged in the decoder to the light board. Match the pins correctly, being certain the orange wire goes to the top left pin #1, marked on the original PC light board, and press firmly together. Match up the fitting tabs of the shell to the chassis and press the shell down to the chassis. The tabs should engage and the locomotive is now ready for DCC testing.

The older model Kato HO SD40-2 had an issue with unstable electrical pick up. I eventually hard wired my electric pick ups between the truck wheels and the PC board (and thus to the decoder). See my additional notes in article entitled '**Hard Wiring the older model HO Kato SD40-2**'.