



Kato NW2 Repair Manual

by Ron Bearden

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The Kato NW2 is an exquisite switcher. This manual is designed to help you not only know how to disassemble and maintain it, but also how to correct a couple of problems that commonly show up.

In the case of the NW2, my locomotive did not appear to be lubricated from the factory and I discovered that it is impossible to properly lubricate this particular locomotive without disassembly. Unfortunately, many people do not know how to disassemble this loco. This doc will help.

And while this is a fantastic locomotive, it does have two flaws which commonly crop up.

My locomotive was far noisier than I think it should have been. The problem was slipping and misplaced gears. This causes a loss of traction and increased noise.

This manual will show how to cure the problem. Follow the captions and the photos as we journey into the internals of this wonderful switcher.

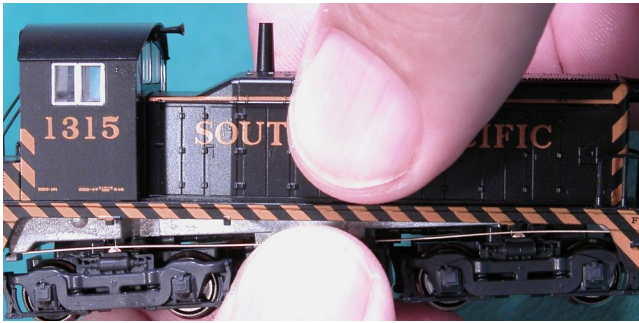


Figure 1

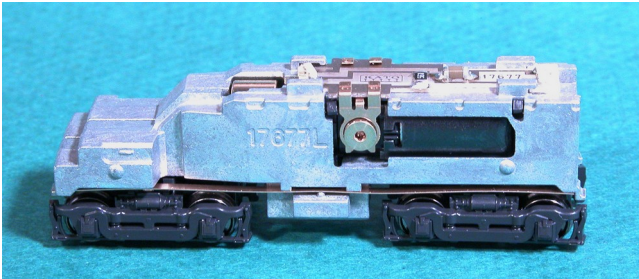


Figure 2

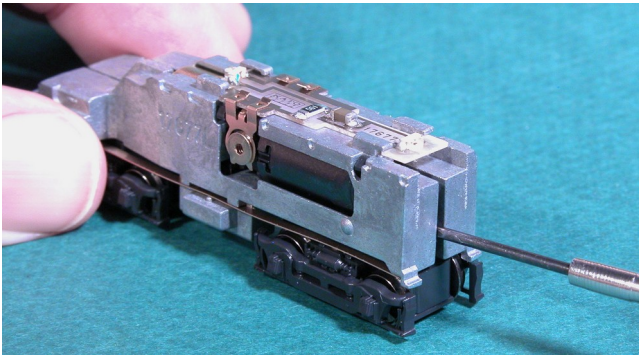


Figure 3

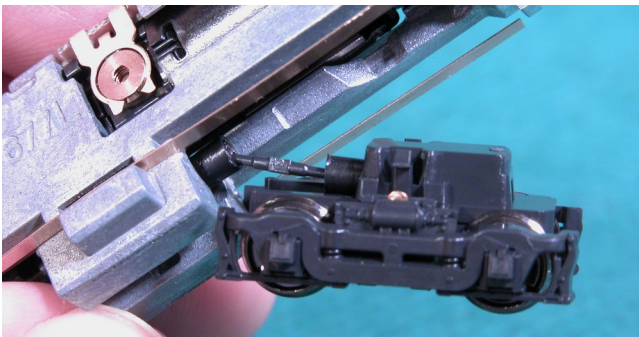


Figure 4

Disassembly of the Mechanism

Figure 1. Hold by the fuel tank/air tanks and pull the shell up by the sidesill around the front truck. If this is your first time getting the shell off, it will be very tight. Wiggle. Rock the shell carefully back and forth. If the fuel tank piece starts to come off, then simply pull it off. The reason to leave it on if possible is that it gives you something larger to hold on to. If you remove it, grasp the metal in the tank area (as shown). After you've removed the shell several times, it will become easier to remove in the future.

If the nose starts to clear the locking bumps, then rock the cab loose above the rear truck. Then pull the shell straight up.

Figure 2. The NW2 follows Kato's new principle of screwless design so care must be taken with the shell off. All the parts can now fall apart! Notice that the cab interior came off with the shell.

Figure 3. Right now, the circuit board clips are holding everything together. Use a flat tool to open the frame halves so the truck can come loose.

Figure 4. You can see that Kato lowered the drive train to make for a very compact design. Just pull on the truck and the drive shaft will pop out.

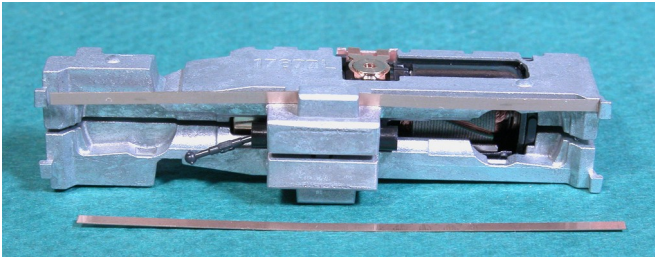


Figure 5

Figure 5. Chassis without trucks. Be warned. Those pick up strips fall out pretty easily and may drive you crazy when attempting reassembly.

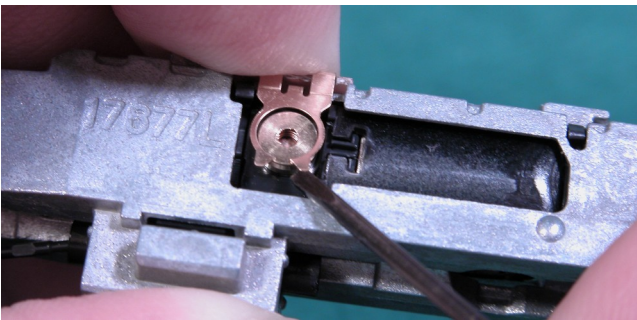


Figure 6

Figure 6. The circuit board clips can be challenging to remove. You might squeeze the board down to take some pressure off the fingers at the motor pole. Carefully lift the fingers free of the pole.

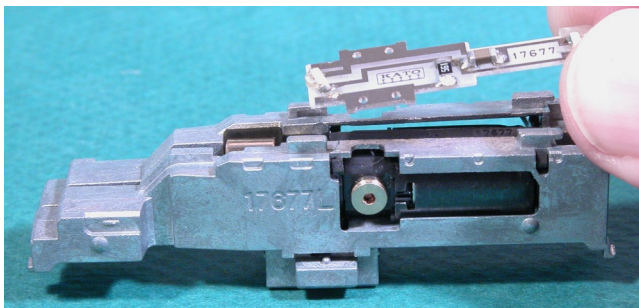


Figure 7

Figure 7. With clips removed from the board, the circuit board slides forward and can be removed.

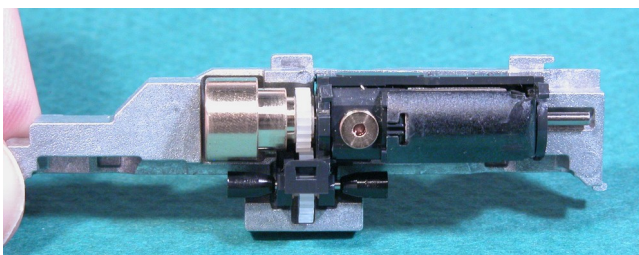


Figure 8

Figure 8. You can see how the motor engages a gear to the lower level of the trucks. I call that lower portion the “transmission” (I don't know what Kato calls it since they don't sell it separately).

Repairing the Common Flaws

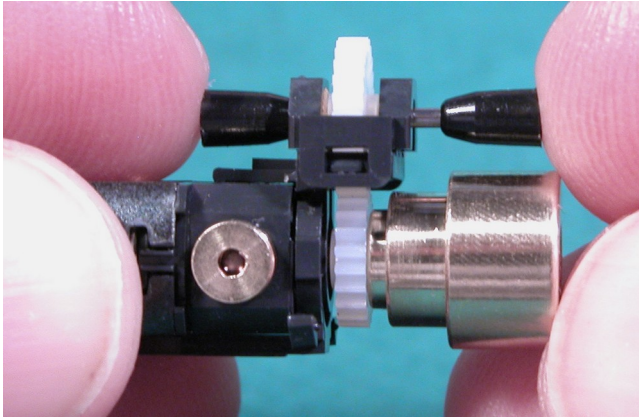


Figure 9

Figure 9. Many NW2s have a problem- the white gears slip on their shafts. The gears are not keyed nor do they hold the shaft tightly.

In this view, I can easily move the upper shaft from left to right. This is bad. When this shaft shifts, it makes the drive shafts out of position. One shaft will be a bit loose, the other will be too tight to its truck thus causing a slight bind and noise.

But there's more. The main drive gear by the flywheel slips too. The end result is excess noise and slippage of the drive train.

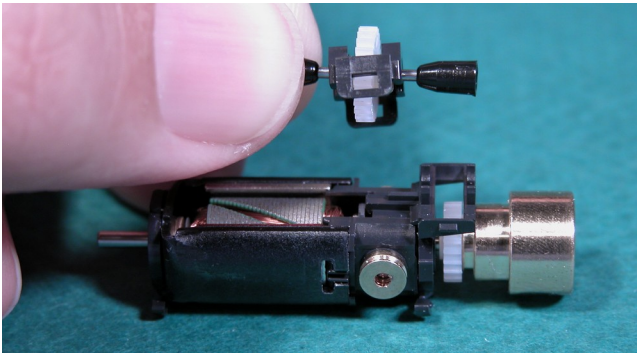


Figure 10

Figure 10. The transmission may be removed by releasing the latches on the edge.

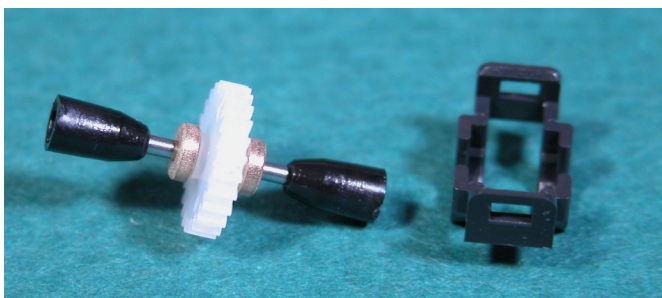


Figure 11

Figure 11. The transmission gear and shaft are easily lifted out of its housing. The housing holds the bronze bearings. The first repair step is to perfectly center the white gear now.

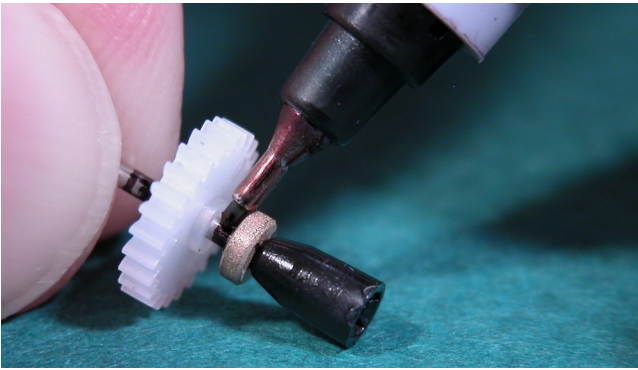


Figure 12

Figure 12. I now move the bearings to the outside and mark the shaft at the gear with a permanent marker.



Figure 13

Figure 13. OK, everything is marked.



Figure 14

Figure 14. Slide the bearings and the white gear off when the ink is dry.

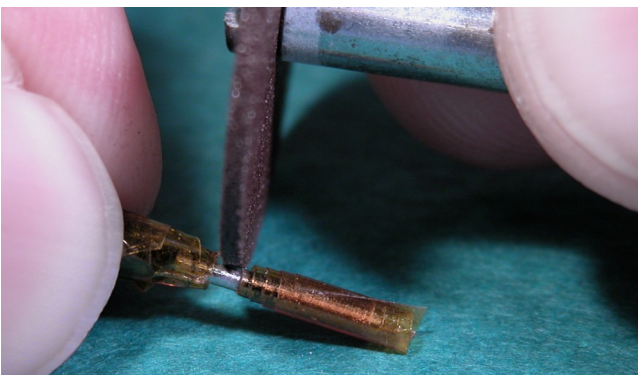


Figure 15

Figure 15. After protecting the shaft at my marks with tape, I then use a ceramic cut-off wheel to scratch the shaft. We want the surface less slippery under the gear.



Figure 16

Figure 16. Here is the results of the roughening under the gear. We marked it because we don't want metal under the bearings to be rough if possible- only the white gear.



Figure 17

Figure 17. After removing the other black u-joint, I use Loc-Tight or superglue on the shaft.

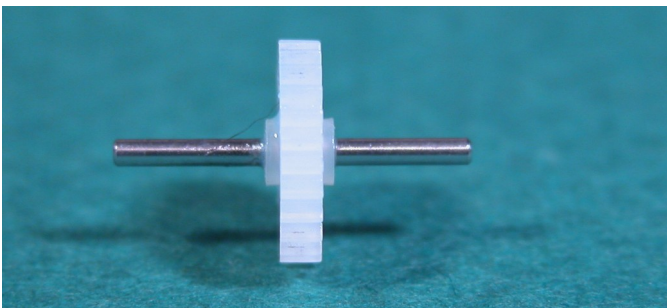


Figure 18

Figure 18. And now the white transmission gear is returned to the very center before the glue dries.

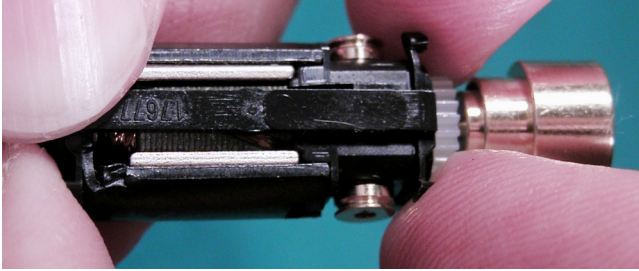


Figure 19

Figure 19. The gear on the motor can slip too. I first move it all the way toward the motor. All the way.

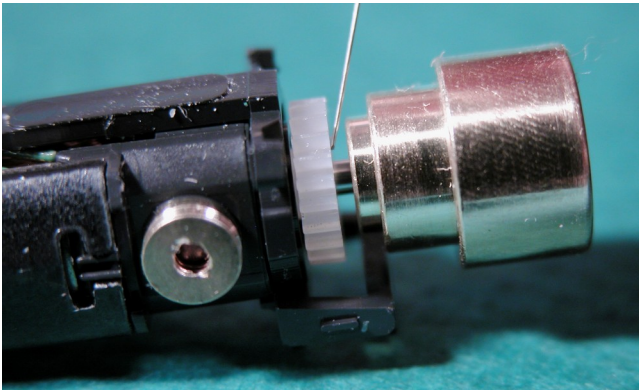


Figure 20

Figure 20. I then add tiny amounts of superglue BETWEEN the flywheel and the gear. A fine wire can apply a tiny amount precisely.

(On second thought, it would be easier to apply the glue to the shaft at the back of the flywheel.)

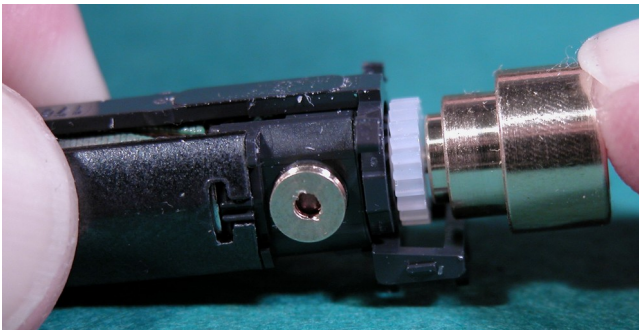


Figure 21

Figure 21. Now push the flywheel to the left to move the gear toward the flywheel, then quickly.....

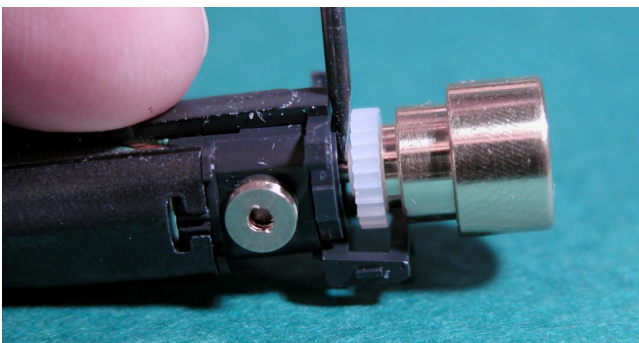


Figure 22

Figure 22. Gently push the gear up tight to the flywheel. We have just glued the gear to the shaft and the flywheel itself.

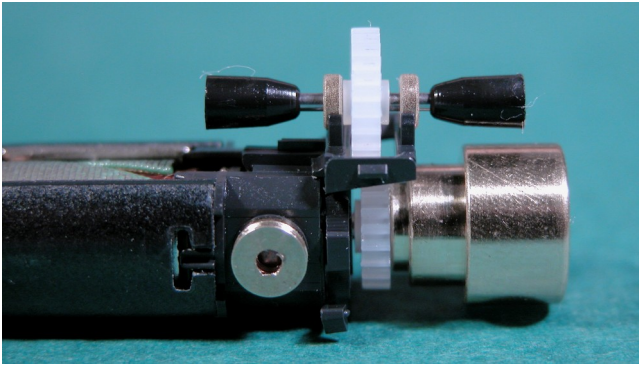


Figure 23

Figure 23. The transmission is placed in the motor bracket after the black u-joints have been carefully placed back on the transmission shaft. You don't want that gear to be moved once it is glued to the shaft. The round bearings go in the slots. Be gentle.

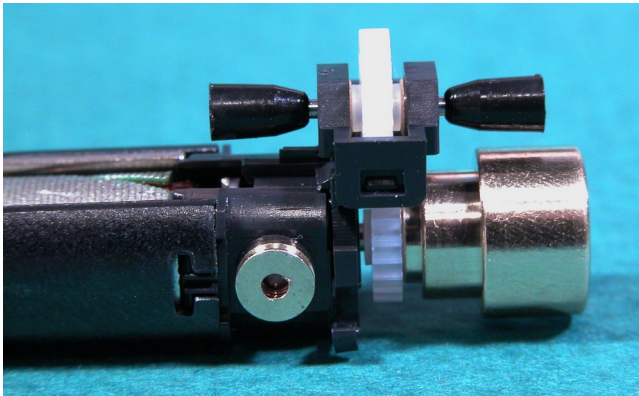


Figure 24

Figure 24. The outer bracket is snapped into place. The noise/slipping problem has been solved!

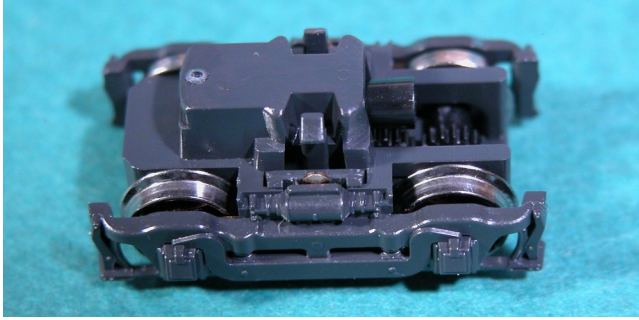


Figure 25

Trucks

Figure 25. The trucks are a very compact design. Wheels are low profile.

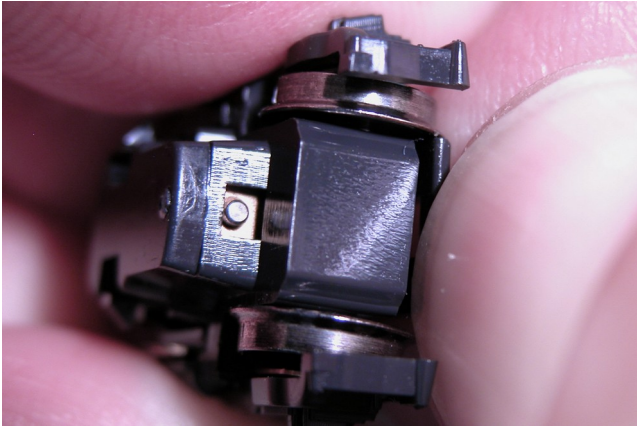


Figure 26

Figure 26. There are no locking latches in the truck- just press fit parts. Use a fingernail to start moving the bottom plate away from the gearcase.

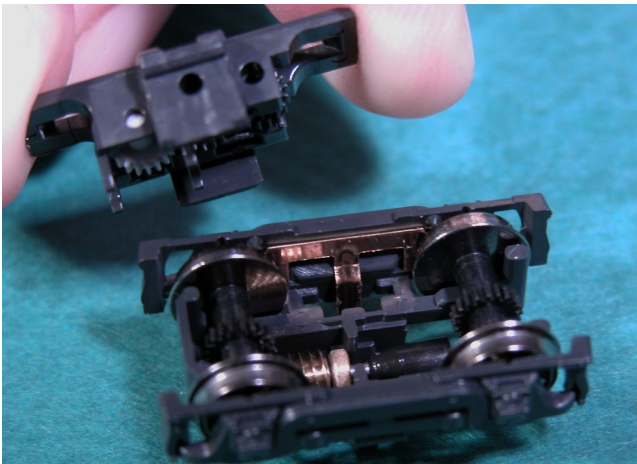


Figure 27

Figure 27. Once loose, the gearcase lifts right up.

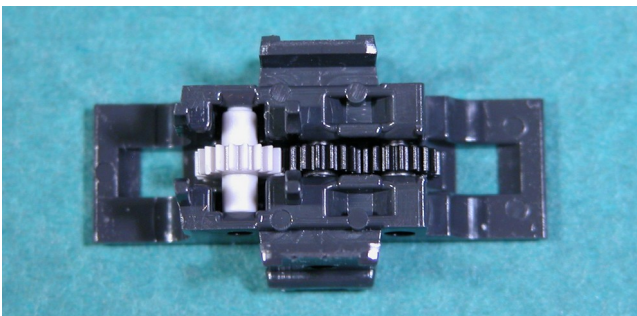


Figure 28

Figure 28. The gearcase holds three gears, but unless there was damage, I would never fool with them.

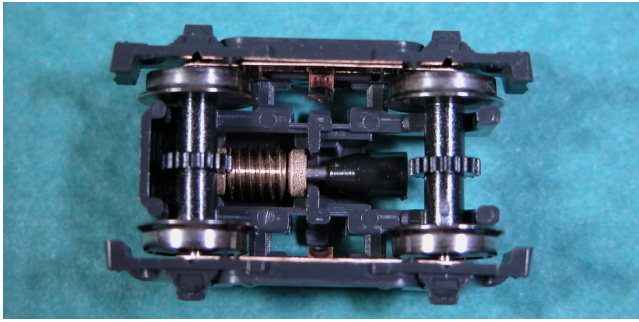


Figure 29

Figure 29. Here is the upsidedown truck. The worm is actually on top.

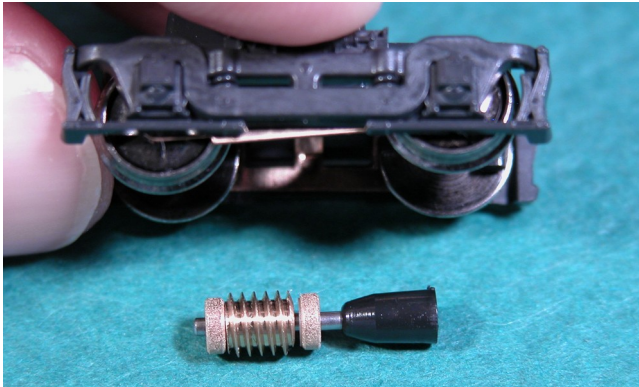


Figure 30

Figure 30. The worm may simply fall out.

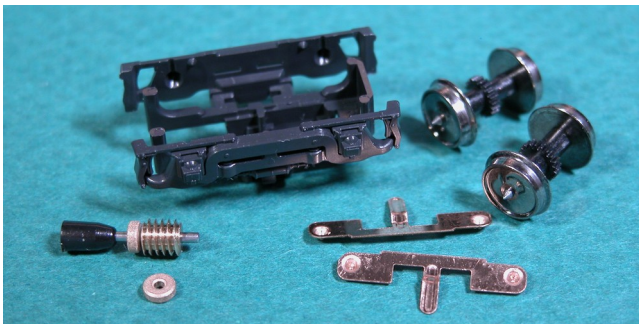


Figure 31

Figure 31. Spread the sideframes and the axles may be removed. Here is the completely disassembled truck-less the gearcase.

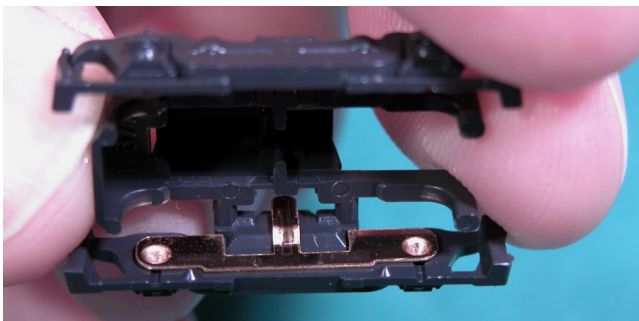


Figure 32

Figure 32. Re-assembly can be tricky because of gravity. First, lay a pick-up on one side.

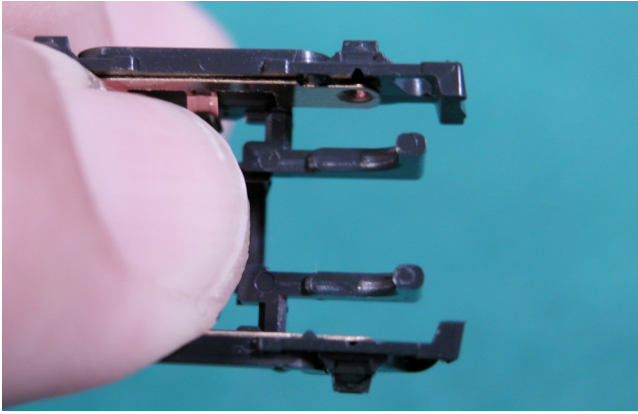


Figure 33

Figure 33. Hold it in place and insert the other pick-up. Hold them both in place with a thumb.

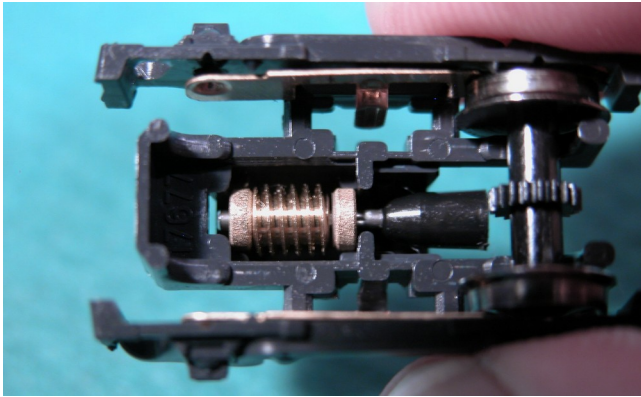


Figure 34

Figure 34. Install the axle away from the worm. The worm can simply drop in.

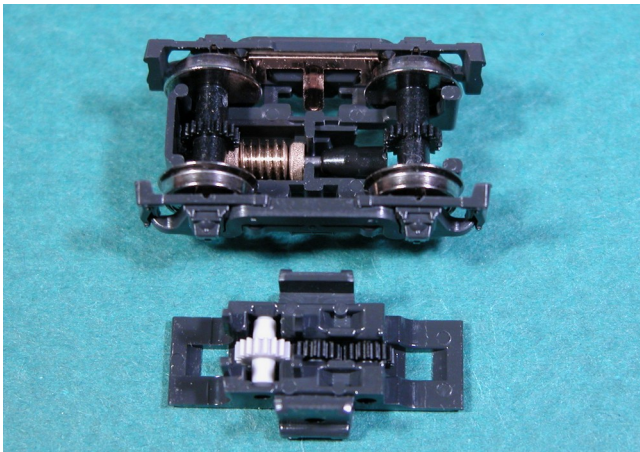


Figure 35

Figure 35. Install the axle over the worm. Then get the gearcase. The gray gear goes over the worm.

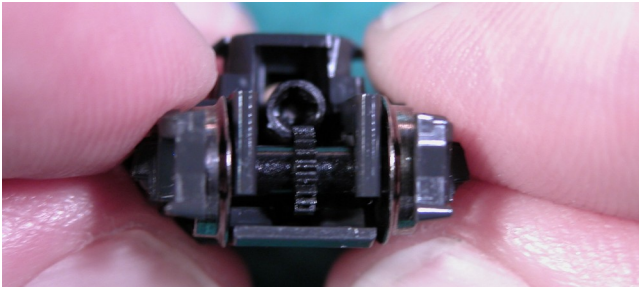


Figure 36

Figure 36. Press the entire assembly tight.

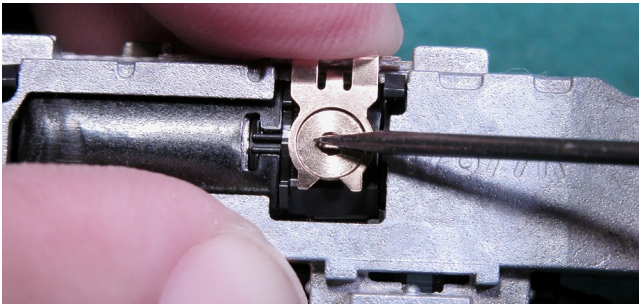


Figure 37

Figure 37. When re-assembling the chassis, the motor lays in place easily. The other frame goes in place. The circuit board is installed. Getting the motor tabs on may be tricky. Since the motor floats a little, you can lift a pole to move it closer to the fingers on the tab while also pressing down on the board.

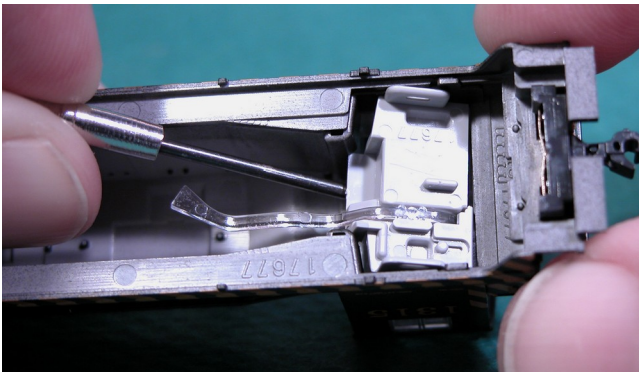


Figure 38

Figure 38. The cab interior is helpful for re-assembly. When you removed the shell, it may get stuck inside the cab.

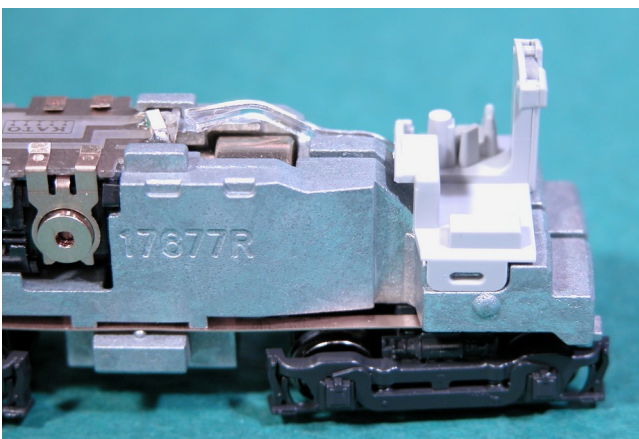


Figure 39

Figure 39. Since the mechanism is screwless, the cab interior and the fuel tank actually help hold everything together.

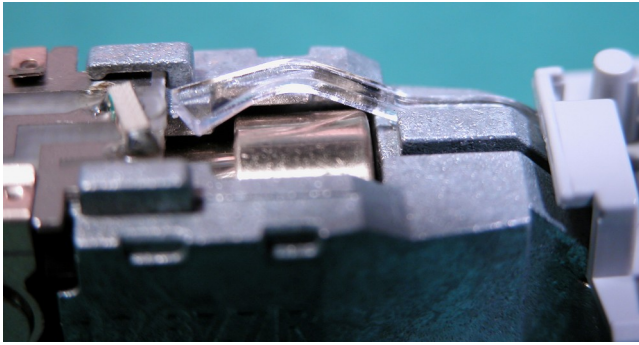


Figure 40

Figure 40. I detected another possible noise problem. It appears to me that the cab headlight tube may possibly rub on the flywheel.

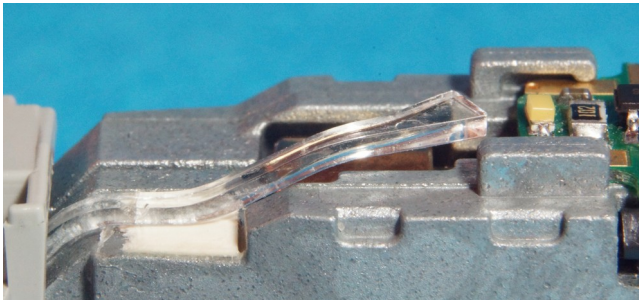


Figure 41

Figure 41. I added a small piece of card stock glued to the frame to lift the light tube up just about 1 mill.

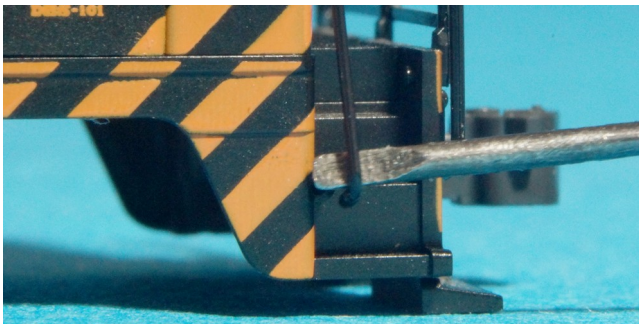


Figure 42

Shell Disassembly

Figure 42. To disassemble the shell, first disengage the handrails at the steps.



Figure 43

Figure 43. And then release the rails at the cab steps.

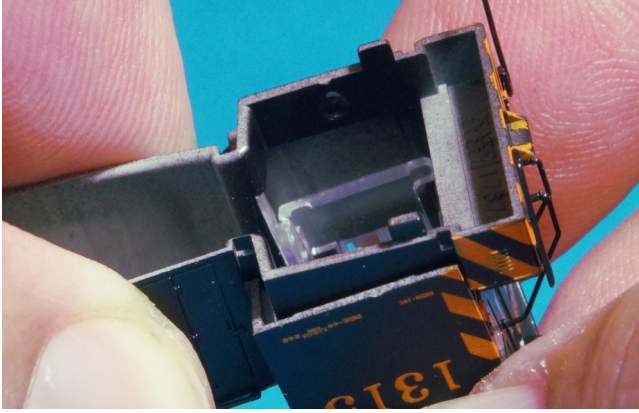


Figure 44

Figure 44. Now the cab may be removed. There is a latch near the battery box. Squeezing the body shell inward helps a little.

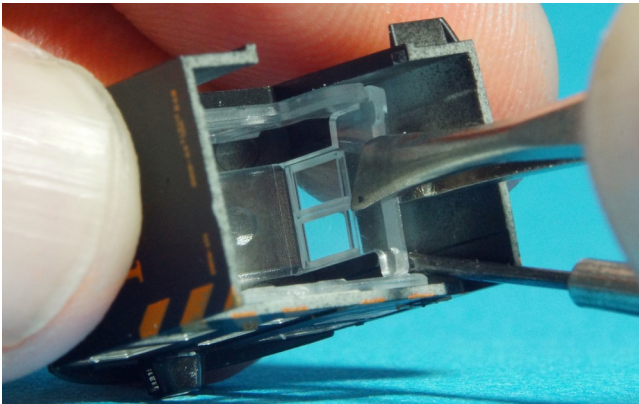


Figure 45

Figure 45. Getting the windows out is the hardest step. Remove the horn and rails to prevent damage. Then insert a small screwdriver between the glass and cab wall. Then use some thin tweezers to start wiggling the glass.

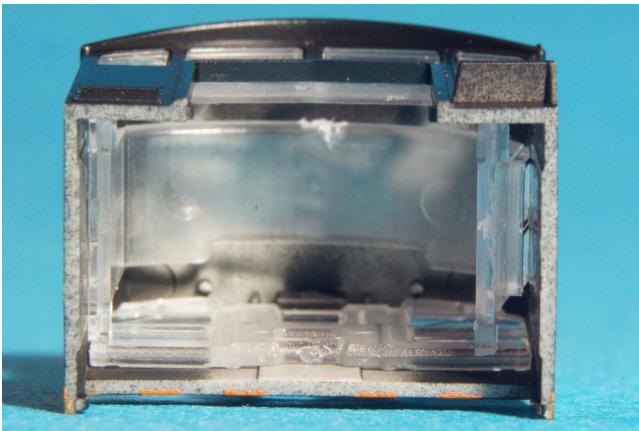


Figure 46

Figure 46. The goal is to get the windows out of the slot- as seen on the right. It is fairly easy going after this.

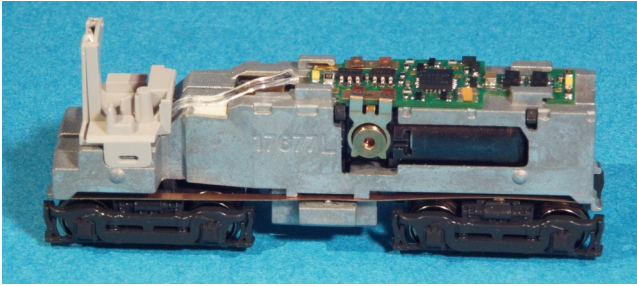


Figure 47

Figure 47. Installing a DCC decoder is pretty easy. Just pull the old board, slide the new one in and install the motor tabs. One challenge is the new board may be slightly thicker and place more strain on the motor tabs- as can be seen here by the way they are stretching apart. Of course different manufacturers will have boards that differ.

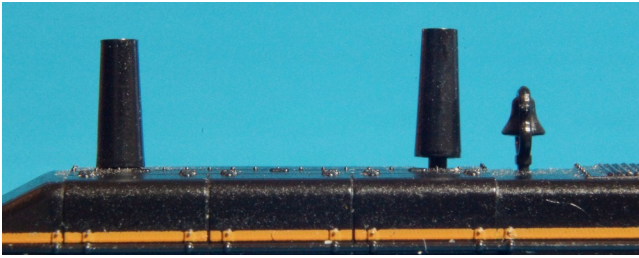


Figure 48

Figure 48. An interesting result of installing BOTH a TCS and a Digitrax decoders when they first came out was that some electronic component on the circuit board was located right under the front exhaust stack (TCS was worse). The solution was to pull the stack off and trim the pin until the stack would sit flush with the shell. Actually, in this photo, the bell looks raised too. I need to trim the pin some more.

CONCLUSION

The Kato NW2 is a wonderful locomotive. By sending the gearing to the center of the mechanism and ending the motor's forward placement inside the front wheel, I take note that Kato has the makings of an SW1 chassis (which has a very short hood). All Kato needs to do is make new main frames which move the cab forward and also end at the front just a fraction past the current motor mount, create a shorter light board, and presto- a new SW1 mechanism!

Other Repair Manual articles by Ron Bearden

Kato GP38-2 & GP50, N-Scale Magazine, July 1990, p. 35-37, CD-ROM Vol 1.

Kato F3 and U30C, N-Scale Magazine, November 1990, p. 16-19, CD-ROM Vol 1.

Kato F40PH, N-Scale Magazine, March 2006, p. 38-45, CD-ROM Vol 4.

Atlas Shay, N-Scale Magazine, March 2006, p. 52-57, CD-ROM Vol 4.

Extensive Rebuild Threads

Overland brass WM Shay: <https://www.therailwire.net/forum/index.php?topic=48999.0>

KMT brass EP-2 Bipolar: <https://www.therailwire.net/forum/?topic=36215.0>

KMT brass E units: <https://www.therailwire.net/forum/index.php?topic=55766.0>

KMT brass Centipede: <https://www.therailwire.net/forum/index.php?topic=36138.0>

Overland brass Little Joe: <https://u18b.com/tutorials/>

KMT brass Silverliner: <https://www.therailwire.net/forum/index.php?topic=32965.0>

and: <https://www.therailwire.net/forum/index.php?topic=34159.0>