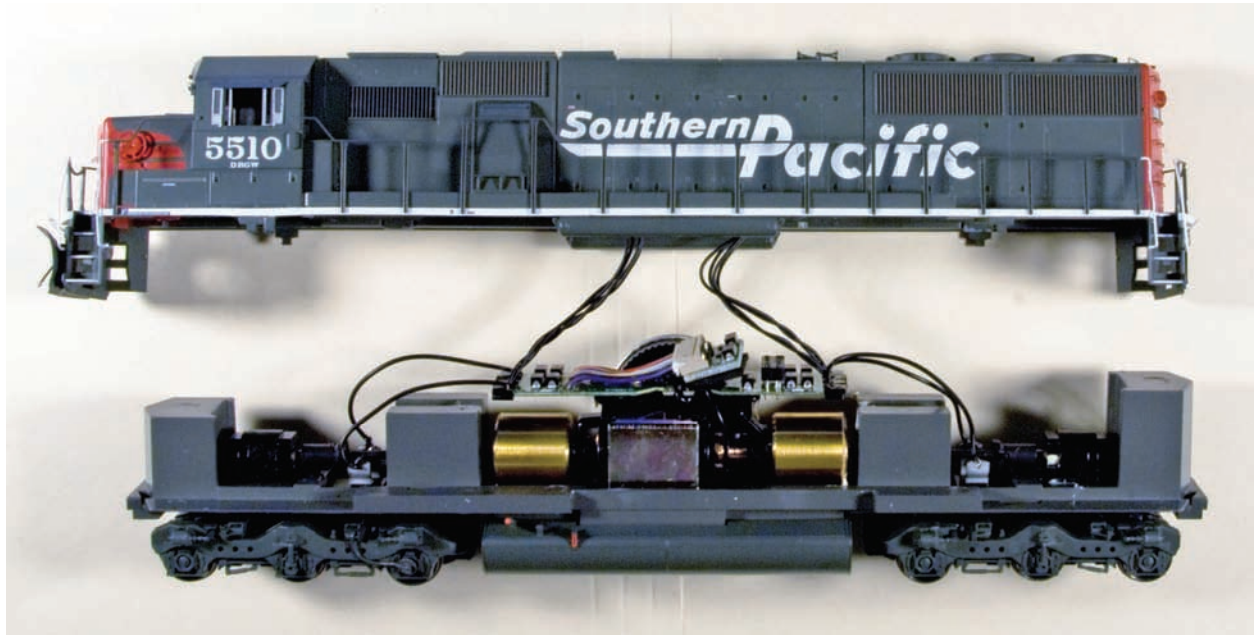


Athearn Re-Motor Clinic



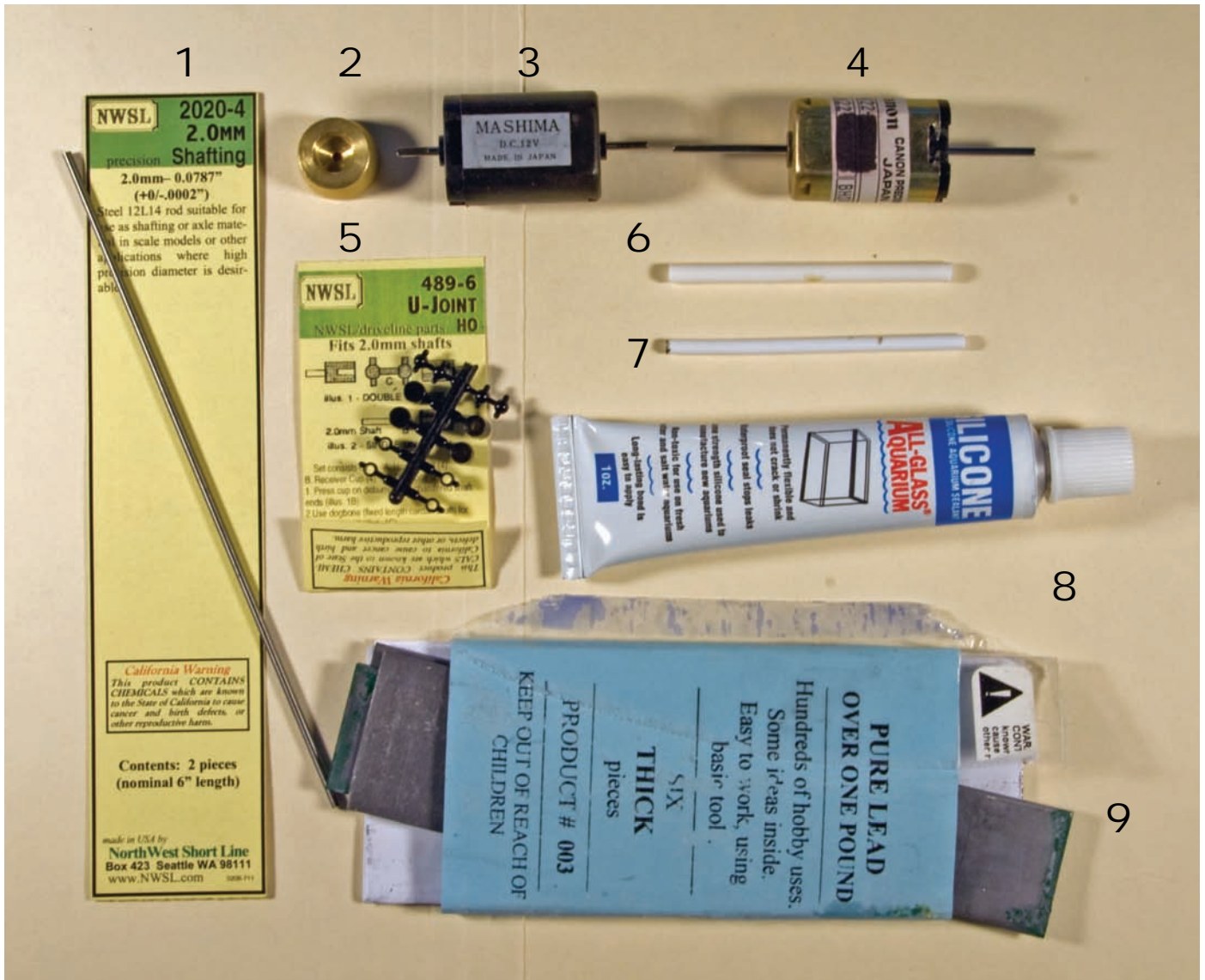
Athearn SP SD50 factory installed motor



Athearn SP SD50 re-motored with a Canon DN-22

Note that the Athearn circuit board was removed. If you want to use the board cut off the clips and glue it on top of the motor with the silicone sealant.

By Robert Rohwer
Sacramento Model Railroad Historical Society



Parts:

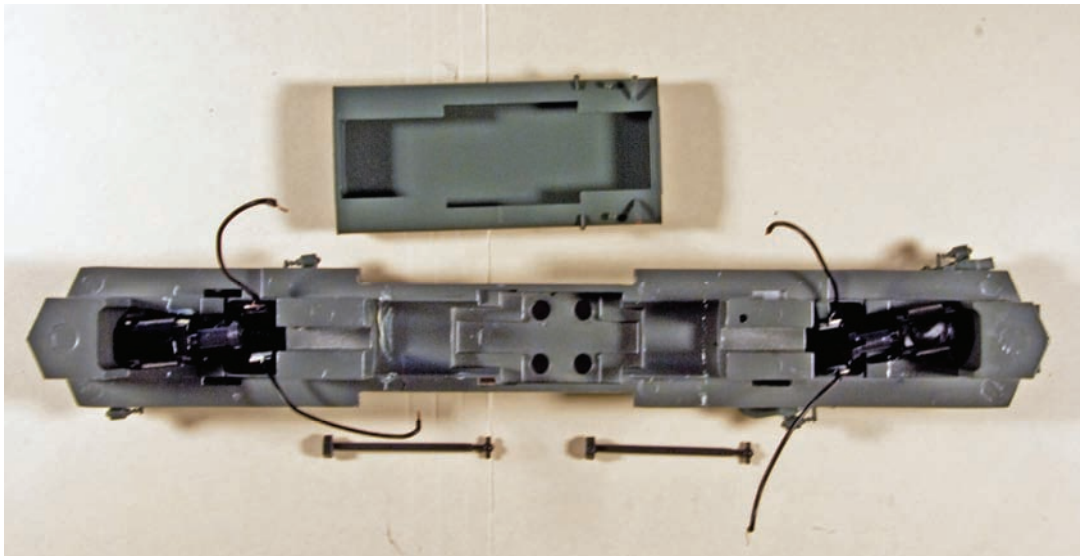
1. NWSL 2020-4 2mm shaft material
2. A-line 20021 Flywheel - 2mm
3. Mashima 18 x33 Motor
4. Canon CN, DN, or EN 22 motor (re-shafted to double shaft)
5. NWSL 489-6 2.0mm Universal Couplers
6. Plastruct 5/32" Styrene tubing
7. Plastruct 1/8" Styrene tubing
8. Silicone Sealer
9. Thick lead sheet

Tools:



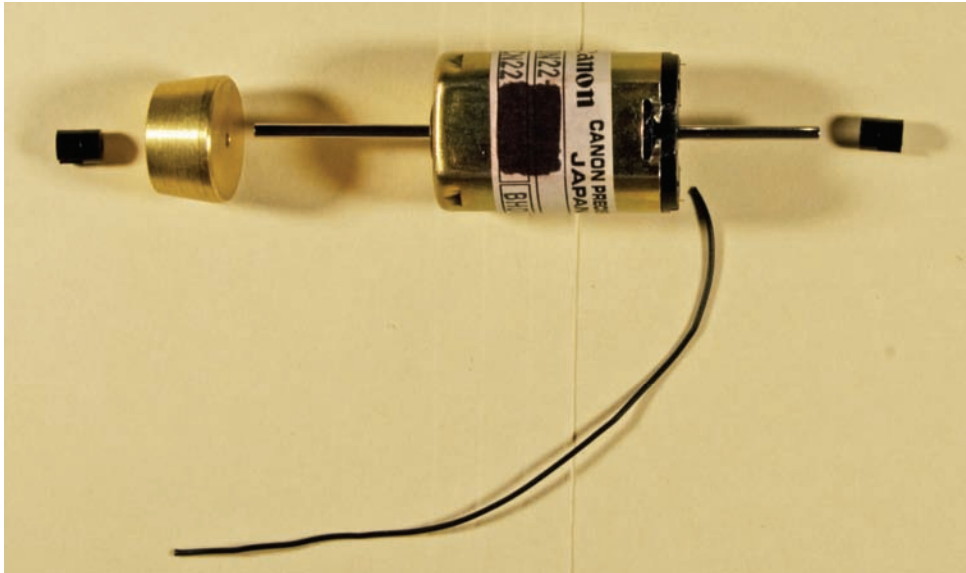
1. Dremel tool
2. Dremel 134 High Speed Cutter
3. Dremel cut off wheel
4. #47 drill and arbor

Step 1—Motor removal



Remove the circuit board and motor. Remove the 4 screws under the fuel tank. Retain the drive shafts since we will use them later.

Step 2—Prepare the replacement motor



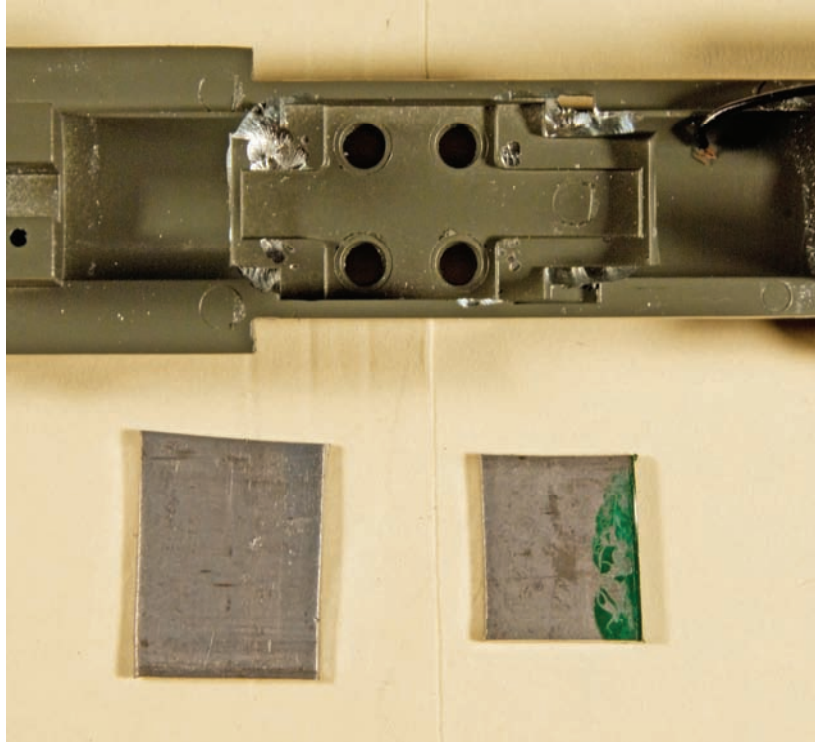
Parts needed: two 2mm NWSL couplers, A-line Flywheel, Canon double shaft motor. Wire for one motor lug.



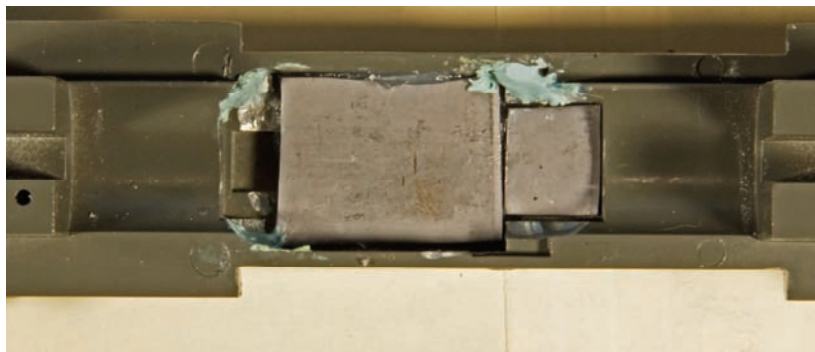
Assemble the motor as shown. Be sure to use the motor shaft when pushing the NWSL couplers on the 2 mm shaft. Do not use the body of the motor. Use loctite or ACC to fasten the flywheel. Be very careful not to get the ACC in the motor bearing. A wire should be installed on one motor lug so you do not have to solder it after the motor is installed.

The motor will be used as a guide to grind out the frame.

Step 3—Grind out the frame



Using the Dremel tool with the 134 High Speed Cutter to carefully grind out the frame so the replacement motor fits. The motor shaft needs to line up with the shafts on the trucks. **BE VERY CAREFUL** not to grind through the sides of the frame. If you do you will have to fill the hole. Be sure the flywheel does not hit the frame.



Cut the sheet lead to use as shims to mount the motor to frame. Install enough lead to raise the motor to the proper height so the truck shafts and motor shafts line up perfectly. Use the Silicon Sealant to glue the lead in place. The sealant will act as rubber mount to absorb vibration from the motor.

Step 4—Make the Drive shafts

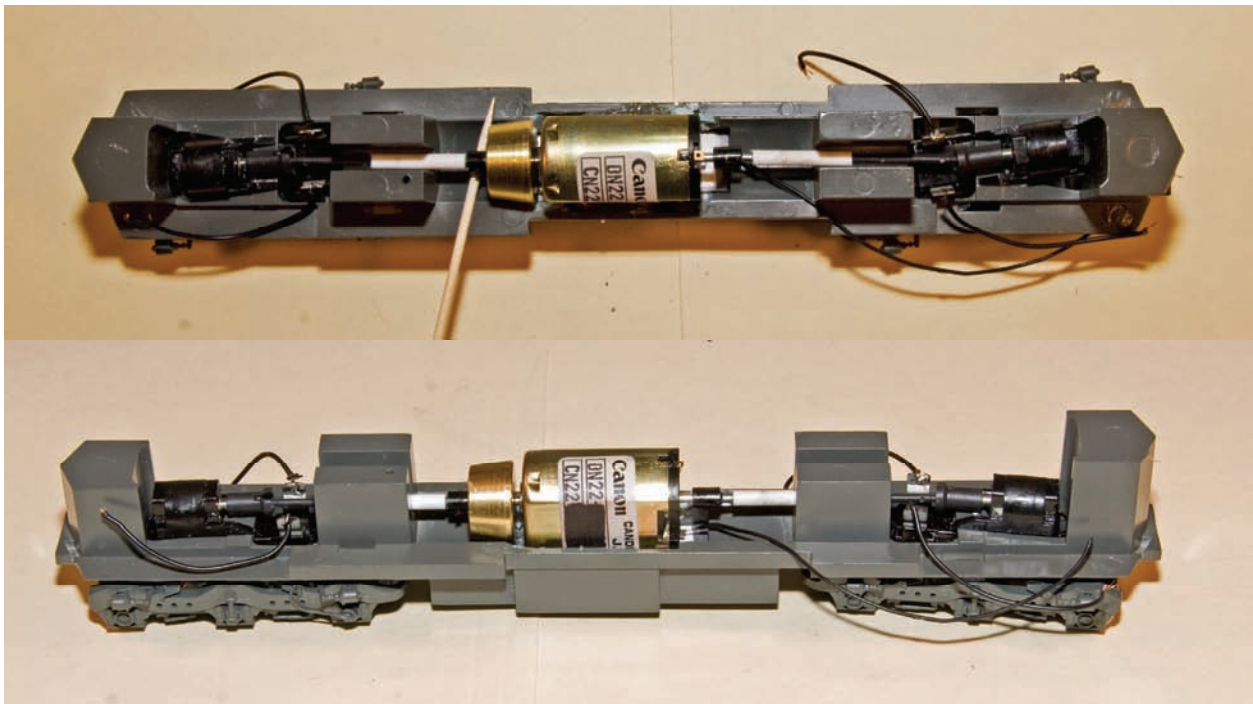


The drive shafts are made from 4 parts.—NWSL 2 mm ball from the coupler set, 1/2" 2 mm steel shaft, either a 1/8" or 5/32" plastruct styrene tube, and the shaft for the Athearn model. The NWSL ball is pressed on the end of the 2 mm steel shaft. About 3/4" of 1/8" Plastruct tube is drilled out with a #47 drill. (As an alternative you can use 5/32 Plastruct tube. This will eliminate having to drill out the tube. It will be a much looser fit). Using ACC or loctite press the 2 mm steel rod onto the tubing. Leave at least 1/8" of the shaft showing. Cut the hex end off the Athearn shaft so it will fit in the Plastruct tube. Use the motor as a guide to determine the length of the shafts. Once the length is determined, use ACC or Loctite and insert the Athearn shaft into the tube. There should be a little play in the drive shafts once they are installed.



The completed drive shaft. Note the balls are a right angles.

Step 5—Glue the motor to the frame



Place a bead of Silicone Sealant on top of the lead. Use enough to make a cradle for the motor. Be careful not to get sealant on the flywheel. You can use a screwdriver or a tooth pick to clean up any excess. Align the drive shafts so they are level with the truck drive shafts. You will probably have to shim the shafts until the glue dries. Note the tooth pick shim in the picture.

Motor notes:

Can motors have gotten hard to find at lower costs. The Canon motors are gone from the liquidators. You can probably get a single shaft motor on E-bay. We can assist you in converting it to a double shaft motor. Sagami Motors are discontinued. That leaves us with the excellent Mashima motors that are about \$35.00 each.

Motor Sources:

A-line: <http://www.ppw-aline.com/>

Roundbell Hobbies: <http://www.roundbell.com/RoundbellCanMotors.html>

E-bay