

NorthWest Short Line

REPOWERING the: AHM/RIVAROSSİ HO HEAVY PACIFIC (4-6-2)

Motor replacement is usually desirable in this model to solve one or more of several problems encountered including inadequate power, unsatisfactory continuous operation performance, excessive operating speed and original motor failure. The model is designed for and built with an unusually short motor thereby making replacement with a satisfactory motor esthetically not fully pleasing because a new motor will in most instances fill or project from the cab rear (unless the modeler opts for a major rebuild of the model). We here describe the simple method of remotoring which can be accomplished in a minimum of time (about 30 minutes with tools and material at hand) and minimum of tools. Although some modelers have reported using the 2032 size motor with satisfaction, we find the 2027 size to be better because the shorter length makes less projection out of the can and the motor has more than adequate power.

Tools required: Miniature screwdrivers (slot and Phillips types)
Soldering device (iron or electronic) and solder
Hand motor tool (Dremel, etc.) or sharp plastic cutting knife and metal file
cut-off disks for above (to cut motor shaft, wormshaft)
saw or grinder for above (to remove plastic material)

Parts required: Sagami 20x27mm can motor - #20273-9 (2.4mm shaft) or #20275-9 (2.0 shaft)
NWSL #482-6 universal coupling set

Parts also useful: NWSL #103-4 thrust washers
NWSL #10003-9
NWSL #2020-4 2.0mm shafting

Skill required: This job assumes you have reasonable proficiency in soldering and disassembly/assembly of mechanical devices. If not, your learning experience here will be valuable despite problems you may encounter in achieving quick and satisfactory completion.

Time required: About 30 minutes (after accumulating tools, materials, etc.)

1. Remove locomotive superstructure from chassis (one screw over the lead truck and two screws under the motor (cab). Remember how all parts fit together, save screws and parts that come loose such as handrails.
2. Unsolder wire to motor brush post. Unscrew motor securing screws and remove motor. Remove “universal” connecting tube. Both these parts can be discarded to your “someday I may find a use for this stuff” box.
3. Note how much wormshaft protrudes from the gearbox toward the motor (the full shaft area, not just the flattened portion). If less than 2.0mm (3/32”) it is desirable to press the wormshaft through the worm slightly in order to achieve that amount of shaft exposure for the universal cup to grip. These worms are often extremely tight on the wormshaft so take extra care to avoid bending the wormshaft—use a vise with appropriate support blocking to hold the worm and clear the shaft being pressed through (but do not press too far, the shaft must still run in both bearings).
4. If you have decided to re-gear this locomotive with appropriate NWSL regear set (we do NOT recommend both re-motor and re-gear because the result is usually a model that runs too slowly), do so at this time. Follow the re-gear instructions. If you damage the wormshaft or otherwise wish to replace it, use NWSL #2020-4 shafting material (2.0mm).
5. If you are re-using the original wormshaft, remove about 3/4ths the length of the flattened portion of the shaft (use a cutoff disk—carefully—or a file, etc.). Reassemble, lubricate and reinstall the gearbox, checking for free turning ability, repair if necessary. Press the 2.0mm shaft universal cup carefully and squarely on the wormshaft (sharp or burred shaft end at the cutoff may need to be chamfered).
6. a. Remove plastic material from the center slot of the motor mount adequate to clear the bearing boss around the motor shaft so that the motor will fit squarely on the motor mount.
7. b. Remove rear motor shaft (between electrical lead terminals) close to the motor.
Caution 1: push shaft through a piece of writing paper to keep grindings away from bearing.
Caution 2: DO NOT LUBRICATE the motor bearings before doing this because the lubricant can trap the cutoff grindings and these can cause serious and rapid bearing wear.
- c. Make sure to remove all grindings from the bearing area.
- 6 8. Solder a piece of wire, such as NWSL #10003-9, approximately 2” long to the bent metal tab on the locomotive frame under the motor (at rear of base of the motor mount).
- 7 9. a. Press the 2.4mm (or 2.0mm if appropriate) bore universal coupling cup on the end of the motor shaft (on the end only—do not press farther down the shaft).
- 8 b. Start the two motor mount screws into the motor end mount holes (a thrust washer such as NWSL #103-4 bronze thrust washer is helpful to give the screw more secure grip on the plastic motor mount).
- 9 c. Put the motor in place and lightly secure the screws with the universal coupling “dogbone” in place and the motor shaft aligned with the wormshaft as straight as possible (the coupler will accommodate misalignment but the more closely aligned the shafts are, the quieter and more efficiently and smoothly the model will operate).
- 10 10. Secure the wires to the motor terminals and operate the model to make sure polarity (direction of travel) is correct (compatible with your other locomotives). If not, reverse the motor terminal wires. Solder the wires carefully to the motor terminal tabs (pre-tin the wires and use a hot iron quickly to avoid excess heat to the brushes or surrounding plastic cap).
- 11 11. Test operate, make any needed corrections. Reassemble the locomotive.
12. Have fun!

Installation 8-84 by F.R. Martin □