



NorthWest Short Line

REPOWERING the

HO Tyco/Mantua 0-6-0t

HO Tyco/Mantua 2-8-2 or 4-6-2

1. The most difficult step – Read all directions and understand the procedure before you start.
2. Disassemble the model - remove the large screw that holds the frame to the boiler.
3. Two screws in the bottom of the frame hold the open pole motor to the frame. Note the brass wiper assembly that delivers power from the fireman's side.
4. Remove crank pins on the geared axle to release side rods. Remove the bottom plate to free the geared axle.
5. Scribe two index lines on the end of the axle and driver hub. Place the driver in a quartering tool to “learn” the feel of its quartering. Notes the amount of play by a rocking motion in both directions. Familiarity with this play will aid in reassembly of the drive later.
6. Use a gear puller to remove the driver. **Caution:** some older driver sets were made of Zamac. Zamac tends to crumble with age. Inspect drivers carefully before taking them apart. If in doubt do not press them. Use a Press Tool in the Puller to prevent the end of the pin from rotating against the index marks on the end of the axle. Hold the puller firmly on a flat surface. This will prevent the press tool from rotating.
7. **CAREFULLY** pressing the axle into the new worm gear provided in kit. The axle gear **MUST** be perpendicular to the axle! If it is crooked the engine won't be any better off than before you started. Even if the gear has a slight wobble it will cause the mechanism to rock, emitted unwanted noise and cause the engine to lope down the track. Press the axle gear slowly and carefully. Stop often and turn the axle 90 degrees and carefully press again. Keep the pressing pin and axle straight up and down. Press the axle until the gear is completely engaged but still at the start of the “friction fit” of the axle.
8. Place the axle in a cradle (such as the axle templates of the Quarterer II) so that you can spin it and observe any wobble in the gear. If the gear wobbles you can attempt to correct it with the Aligner tool but if the gear is badly aligned you should start with a new gear. (The hole will remember the previous press and tend to follow it.)
9. Continue to press and check the squareness in this manner until it is centered evenly on the axle. If you press too far use the puller to press it back to centered. Digital calipers can aid in proper positioning of the gear.
10. Finish putting the axle together. The two index marks you made on the end of the axle and wheel hub are used as reference to set the driver back to its original position. The axles are often splined which will limit the positions the wheel could take. Place the axle in the quartering device and press the driver enough to firmly start it onto the axle. Rock the axle as in step 6 to gauge the feel of the play. It should be the same as before you removed the driver.
11. When the quartering is correct press the driver home. Check the wheel gauge with a NMRA gauge.
12. Check for wobble once more then reassemble the axle back into the frame.



13. The worm should already be pressed onto the shaft of the motor provided in the kit. Use the Quick Mount provided to position and hold the motor on the frame so that the worm and worm gear mesh tightly. Make sure the motor shaft and worm are parallel with the worm gear and that the mesh of the worm and worm gear is centered on both gears. Centered and square!
14. Carefully remove the motor from the Quick Mount keeping the memory of the motor position in the soft material. Apply a permanent attaching material such as silicone caulk or we prefer Permatex Ultra Black Gasket Sealer #81280 around the Quick Mount. Use rubber bands to hold the motor tightly in place.
15. Force a piece of .010" wire between the meshed teeth of the worm and worm gear. This will insure proper clearance of the gears.
16. Carefully recheck all centering and squareness as before. Then set the assembly aside until it fully cures (overnight).
17. Use an ammeter test the motor and note the current being drawn; the motor and gears should run freely and quiet at less than 100ma at about 7-8 volts. If the worm seems too tight you can force a piece of .020" or appropriate wire into the Permatex under the front of the motor to lift it off the gear. If it seems too loose you can cut the motor loose and reposition it with more compound.
18. Lube the gears with good grease or heavy oil – not too much. Lightly lube the axles, crank pins and place a tiny drop on each of the motor bearings. Let the motor run a bit to work the lubricants into the bearings.
19. Solder wire leads to the motor terminals. The positive lead will connect to the frame or Engineer's side. Use the wire tab in the kit and find a place to attach it to the frame with a screw. We suggest the screw that holds the Fireman's side wiper tower. Attach the negative lead to the brass wiper assembly on the Fireman's side.
20. Place the frame on the track and check that everything works properly. Insure your switcher goes the same direction as another engine. If it doesn't you have the motor leads reversed. Once you are satisfied with how the engine runs put it back together and enjoy.

By Derrell Poole, 2011

#1172-4 Tyco/Mantua 0-6-0 RePower KIT, \$42.95

Kit contains:

- (1) Motor, #1630D-9
- (1) Worm, #50400-6
- (1) Gear 0.4 x 32T WG, #2284-6
- (1) Quik-Mount, #199-6 (1")
- (1) Wire, #10010-9 (6")
- (1) Tab, # 120-4

#1174-4 Tyco/Mantua 2-8-2 or 4-6-2 RePower KIT, \$42.95

Kit contains:

- (1) Motor, #1630D-9
- (1) Worm, #50400-6
- (1) Gear 0.4 x 38T WG, #2276-6
- (1) Quik-Mount, #199-6 (1")
- (1) Wire, #10010-9 (6")
- (1) Tab, # 120-4

Recommended NWSL tools:

- #50-4 Sensipress+
- #45-4 Puller 45-4
- #44-4 Quarterer
- #33-4 Aligner
- #4546-4 Press tool 4546-4
- NMRA HO Gauge

Recommended Resources:

- www.nwsl.com
- <http://www.hoseeker.net/>

Don't want to do the install yourself?
NWSL will do it for you for an additional \$99.95.
Send in your Doodlebug along with a note stating you'd like NWSL to install the repower kit to:
NWSL
PO Box 1349
Hamilton, MT 59840, USA