

# NorthWest Short Line

## **REPOWER the: KATO/Stewart HO Scale F-3, F-7, etc. to match Athearn** (repowered diesel locomotives)

This locomotive model has a fine running mechanism but will not double-head with (NWSL powered) Athearn operating speed. This repowering will result in the KATO diesel operating at almost identical speed as repowered (with NWSL 1836 motor such as #161-4 and #163-4 repower kits) Athearn diesels thus permitting such repowered units to operate compatibly and/or work together.

Here we describe the general repowering upgrade method we used which can be accomplished in about 30 minutes (plus curing time of 24 hours) if proper materials and tools are on hand.

- Tools required:** Hand motor tool (Dremel, etc.) with cutoff disk to cut motor shafts  
Soldering iron to wire motor; Hobby knife; Cross-point and blade screwdrivers
- Skill required:** This job assumes you have reasonable proficiency in disassembly/assembly of small mechanical devices. If not, your learning experience here will be valuable despite problems you may encounter in achieving quick and satisfactory completion if you are patient and methodical.
- Time required:** About 30 minutes plus 24 hours
- Parts required:** NWSL coupling set#491-6; NWSL #18335-9 or #18337-9 motor;  
NWSL #403-6 flywheel(s); Hookup wire (#10004-9, #100005-9 or similar)  
Silicon sealant (at hardware or similar stores - sold as bathtub caulk, etc.) - use clear

1. To remove F unit shell, first remove front coupler by removing bottom clip from coupler pocket. Shell is held to frame by four catches attached to the porthole window assembly. Gently pry sides of carbody away from frame (about 1/2" inboard of steps) and lift shell. This may take a number of attempts from side to side until all four catches release from the frame. Remove fuel tank to expose motor mount screws. Unclip truck pickup wires from "headlight board" on top of motor and remove motor and headlight tube assembly. Unclip worm cover from each truck and remove trucks. Remove u-joints from wormshafts.
2. Install 2.0mm cups from #491-6 u-joint set on wormshaft as close to bearing as possible without rubbing on the bearing - it may be desirable to shorten the wormshaft so that it does not project into the sliding area of the cup but I didn't bother.
3. Solder motor wires to motor terminals so that both wires emerge "upward" from motor when it is placed in the locomotive frame. prepare the motor by shortening motor shafts to approximately .325" (5/16" or 8mm). Chamfer the shaft ends carefully and install flywheel(s) as desired and then the 2.4mm bore u-joint cups to motor assembly. Trial fit motor location in frame - it is desirable to have the motor equally spaced between the trucks (so that the u-joint cardan shafts [dog bones] can be as long as possible). Mount motor using a small amount of silicon caulk daubed in the bottom of the frame cavity so that it will squeeze up the sides of the motor as the motor is pushed down into the frame. The motor must sit as low as possible in the frame so there will be a minimum amount of caulk between the motor and the frame on the bottom and sides, but enough that the motor does not actually touch the frame anywhere.  

Put the assembly away and let it cure for 24 hours - siesta time!
4. Sit frame back on wheels. Make up cardan shafts (dog bones) so that the horns of the horned balls are in the same plane. Make sure that long round shaft cutoff end is carefully de-burred and chamfered before pushing it into the horned ball.
5. Snap on worm covers to hold trucks in place. Wire locomotive and check polarity (if travel direction is wrong, reverse the wiring). I soldered wires after crimping clips on truck wires but that was not necessary.
6. Test operate the model. Adjust components as necessary for smoothest operation. When satisfied, re-assemble hood and cab to chassis. Due to higher ratio KATO trucks (relative to Athearn) and higher speed of the 1833 motor (relative to the 1836), the locomotive will now double head very well with Athearn locomotives which have been repowered with the #18363-9, #18365-9, #161-4 or #163-4 kits. NWSL does manufacture wheels for the KATO and Stewart diesels - see #37191-4 et al.

*Installation 2-93 by L D Richards*

*NOTES on what I learned on this project that will be helpful on future projects:*