

NorthWest Short Line

REGEAR / RE-MOTOR PROJECT IDEA

The F.E.D. Spartan Series HO/HOn3/TT 4-4-0/2-6-0

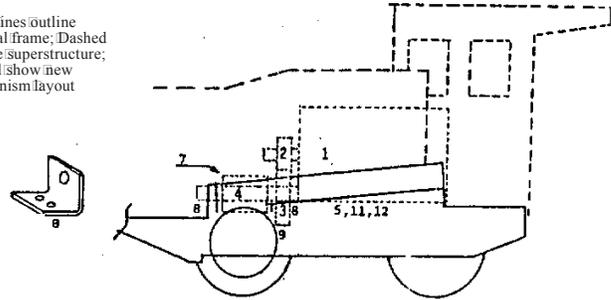
Eliminates tender drive problems

Gets entire drive within the boiler

Uses NWSL can motor (#10203-9 or #10253-9)

NWSL gears for quiet, slow, smooth operation

Solid lines outline original frame; Dashed outline superstructure; Dotted show new mechanism layout



Parts Required:

Motor - NWSL #10203-9 or #10253-9 (#10253-9 provides more power, slower speed but extends further into cab)

10 tooth 72DP spur gear - part #17410-6 (1.5mm bore—if 1220x-9), #17810-6 (1.2mm bore—if 10203-9/10253-9)

20 tooth 72DP spur gear - part #17520-6 (brass) or part #18520-6 (Delrin) (2.0mm bore)

Project Procedure

1. Original worm salvaged from model (press off shaft carefully, we cannot supply replacement if damaged). If replacement required, order #301-4 (driver with NWSL wormgear and worm)
2. Cut, file, gouge, grind or mill out original frame material to make horizontal mounting area for can motor (be careful with frame, replacements for destroyed frames are NOT available).
3. Cut a 4mm length (5/8") of 2.0mm shaft material - part #2020-4 (use cutoff disk for easiest cutting).
4. Assemble worm and 20 tooth spur gear on 2.0mm shaft with 1.5mm (1/16") space between them. If worm is loose, either knurl or upset shaft at worm location and press worm on or bond worm in place with Locktite, ACC, etc. using care to keep excess bonding material from creeping down shaft to bearing area. The SENSIPRESS+ (part #50-4) makes this assembly easy.
5. Make shaft brackets of brass (.015 or .020 material) or preferably bronze. Front bracket can be bent (see sketch above) and screw attached to frame ahead of worm/driver. Rear bracket can be made similar but is more difficult to fit while taking as little space as possible and avoiding interference with motor mounting. Grind away frame material as necessary to make space for the bracket to rear of 20 tooth spur gear. Be sure to make bearing brackets so you have some vertical adjustment latitude to get worm location proper. Bearings for the 2.0mm shaft can be 2.0mm holes drilled in the brackets, but a better choice is to install NWSL bronze bearings (part #356-6) in the brackets (file the rear bearing thin as necessary to fit the space available).
6. File, grind, etc. slots in frame siders to clear the 20 tooth spur gear (remove as little as possible to avoid unnecessary weakening of the frame). Install bearing brackets. Test fit wormshaft assembly with bearings. When worm/axle gear mesh is correct and 2.0mm shaft is horizontal, secure shaft bearings in place.
7. Press 10 tooth gear onto the motor shaft (be sure to press from motor shaft end, NOT on the motor itself when making this assembly). The SENSIPRESS+ helps you easily accomplish these tasks.
8. Fit the motor in the "bed" you made in the frame. Check gear mesh and alignment. Gear teeth should mesh snugly, but not tight. If not, rework "bed" as necessary. When correct, locate motor mounting screw holes (side of can, not end) and drill in frame through bottom. Secure motor in place with 1.4mm screws (cut 6mm screws to length as necessary to assure no more than 2mm length extends into motor can approx. 1/16").
9. Adjust motor height with shim material (paper, etc.) as necessary for best gear mesh which will be when gear operating noise is the least.