

NorthWest Short Line

REPOWERING the: DELTON #1 GAUGE D&RG C-16 2-8-0 (mark I)

This motor replacement using NWSL Pittman 30541-9 motor and NWSL #1252-6 gearbox kit provides performance and reliability improvement for this fine model - smoother, quieter, slower operation with improved power. We here describe the general method we used which can be accomplished in about 3 hours (plus overnight bond set time) if proper materials and tools are on hand.

- Tools required:** Miniature screwdrivers
Gear puller (such as NWSL's THE PULLER #45-4)
Hand motor tool (Dremel, etc.) and grinding bit
- 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 3 hours (plus cure time for bonding agent and sealant)
- Parts required:** NWSL PITTMAN can motor - #30541-9
Silicon sealant (sold at hardware stores as bathtub caulk, window caulk, etc.)
NWSL #1252-6 gearbox kit (or the heavier duty #652-6 gearbox)
NWSL #495-6 universal connector
Wire 28 or 29 gauge, two approx. 1.5" pieces

1. Remove superstructure (boiler, cab, etc.) from locomotive chassis.
2. Remove original motor.
3. GEARBOX PREPARATION:
 - 3a. Remove geared driverset from chassis. Mark (scribe) axle end/driver wheel hub so wheelset can easily be re-assembled in same quarter. Remove driver wheel. Remove axle gear from axle. Press axle into new axle gear. Align axle end mark with wheel hub mark and reassemble driver wheel in same location (quarter). CAUTION - axle knurl!
 - 3b. Geared driver will be moved to the #2 driver location for this re-powering. Remove #2 driverset and install in #3 location. You will need to make clearance for the new gearbox as follows: Mark bottom cover to show location of new gearbox - cut or mill out this area (approx. shape and size of the gearbox). Now go to chassis area above the axle gear and do the same. Again, make hole only slightly larger than the gearbox - the hole must be big enough to let the gearbox float freely, but small enough to retain the gearbox from moving forward and backward more than about 1/8" (or u-joint may uncouple).
 - 3c. Assemble gearbox with wormshaft toward rear of locomotive (this will have to be cut to length after fitting motor and a 'D' flat filed or ground on it to fit the U-jt cup).
6. Test operate (if drawing high amp - over 0.5 amp - or overheating, something is binding), adjust as necessary - see note 1 describing a situation that will cause overload and early failure.
7. Reassemble model and test operate the model on powered track. Check operating direction (polarity) against another locomotive; if wrong, reverse the terminal wiring connections at wiper wires.
8. Lubricate wormshaft bearings with light lubricant such as LaBelle #108. If you have interior lighting to hook up - connect the wiring to the terminal wire/wiper wire connections on each side of the motor. Enjoy!

Installation 12-95 by John T Colman

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

- *1. Some units have been reported with axle knurl wider than the axle gear - if you experience this problem, the knurl must be removed in the axle bearing area to provide a running surface for the axle bearing. A better solution is to use a driverset without knurl (trade driversets or axles). Use of the #652-6 gearbox which has a wider axle gear may also be a solution for this problem. Failure to correct this problem will result in overload - slow operation, high amp draw and premature failure of the gear, motor, or other component.
4. MOTOR PREPARATION:
 - 4a. Motor will sit in front portion of the firebox. Existing firebox area "floor" will have to be removed sufficient for motor to fit.
 - 4b. Cut motor front shaft (end away from terminals) to approximately 1/4". 'D' flat as necessary for u-jt "horned ball" (protect motor bearing area to keep chips or filings out of bearing). Remove other (end) shaft if desired (or you may wish to install a flywheel).
 - 4c. Cut vertical slot in front wall of firebox to clear motor shaft and u-jt. Press motor in place to determine fit and any adjustment, adaptation that may be required. Motor shaft should line up with gearbox shaft. Install motor support cross frames (make of material cut out to clear motor or wood) under motor to seat it.
 - 4d. Make an 'L' motor mount bracket for rear of motor so that vertical leg screws to motor (end) mount holes and horizontal leg screws to firebox floor. For more secure motor mounting, run a bead of silicon sealant down each side of motor against firebox sides.
 - 4e. Solder motor terminal wires to motor terminals.
 5. Insert motor assembly for final fit and operation check. When satisfied, remove and install u-jt cup on gearbox shaft. Insert motor assembly into cavity with u-jt connected. Solder terminal wires to wiper wires.