

Installing the ATHEARN DIESEL

RE-MOTORING KIT #161-4 or #163-4 #161-4 consists of 1836 SAGAMI motor with pre-mounted flywheel #163-4 consists of 1836 SAGAMI motor with 2 flywheels pre-mounted

plus:

- terminal wiring leads attached, with extra hookup wire
- NWSL QUIK-MOUNT
- 2 bronze thrust washers #102-4
- 1 variable length universal coupling set #491-6

Supplies and tools suggested:

- Soldering iron and electronic solder; Silicon sealant (sold as bathtub caulking, etc.); double stick tape or other; Rubber bands (to hold motor in position for gluing); Hobby knife or single edge razor blade or CHOPPER; If frame grinding required: Modeler's motor tool with grind stone and/or milling cutter Eye protection

We suggest you try our way first:

- Before starting, put locomotive on track, note and record the direction of travel in relation to power pack direction switch.
- Remove superstructure of model. Carefully remove dynamic brake blister (if any).
- Remove upper electrical pickup strip.
- Remove trucks by gently prying off worm cap with small screw driver or similar
- Trucks may be disassembled, cleaned and oiled at this time (use a plastic compatible oil). Worm end play is a major source of downhill lurch in model locomotives. Included in this kit are bronze thrust washers which may be used to shim worm end play. Add washer as necessary between worm and wormshaft bearing to minimize worm end play. Test with worm cap on (with truck off frame). Worm shaft should turn freely with a minimum of end play in shaft. Remove ATHEARN u-joint from wormshaft
- Re-install trucks.
- Remove the original motor from frame by gently twisting motor loose from rubber mounting pads. For most installations, remove rubber motor mount pads and reverse them (turn them 180 degrees in the locating holes). Test fit motor (shaft alignment) and trim or turn pads as necessary so that the motor shaft lines up as close as practical (vertically) with the worm shafts. Once motor is aligned vertically with worm shafts, test fit motor fore and aft in the chassis for the least interference with the chassis and superstructure. Note that on the latest Athearn hood locomotives, especially those with 4 vertical mounting lugs (GP-38-2, etc.), the hood is an extremely close fit with the motor. It is usually easiest to position the motor fore and aft for the least interference with the superstructure and remove material from the frame as necessary. Carefully remove material from inside the body shell to clear the motor, if necessary. We use a flat sided grind stone in a hand motor tool (use eye protection) taking care to not melt the plastic. It usually helps to remove the dynamic brake blister section (if used) so that you can see into the shell. Once satisfied with the fit, check for interference of the motor flywheel(s) with the frame. If frame material must be removed, we use a hand motor tool with a "milling cutter" tool. Use eye protection and work carefully and slowly as this material tends to be soft and gummy and can catch any cutting device. Test fit frequently and remove only as much material as necessary to provide clearance.
- Install the 4 u-joint "cups" on motor shafts (2) and worm shafts (2).
- Mounting the motor: NWSL Quik-Mount is been included to aid you in trial mounting of the motor. For permanent mounting, various methods have been successfully used including double

stick foam tape and 'shoe goo' (used to build up worn running shoes). We prefer silicon (bathtub sealant which is readily available under various brand names at hardware stores. Since most of these products emit acetic acid fumes while curing which can damage (corrode) interior motor parts, we suggest that a small piece of tape be placed over all open motor screw holes until the material has cured. This will also eliminate the possibility of the sealant entering the motor and damaging the armature as some modelers have experienced.

For a better bond, roughen the motor surface (to be bonded) with sandpaper, file, etc., and thoroughly clean the surface of any oily residue that may be present. Spread a bead of glue (sealant, etc.) on motor, place motor in position on the rubber motor mount and use rubber bands to secure in position. Make absolutely sure motor shafts are aligned with worm shafts and horizontal as there is very little room to clear some superstructures. We usually check alignment (and adjust as necessary) several times during the first hour of drying. (Modeler tip from George Davis: Align motor-to-worm shafts with brass tubing that slides on shafts to hold motor in place while mounting sealant cures, then remove tube aligners and install U-joints.) Our experience is that silicon sealers require at least 48 hours to be thoroughly cured. Additional sealant can be added as desired or necessary at any time.

10. The intermediate u-joint section is a very tight press-fit and care must be taken with its assembly. Remove long horned ball and shaft piece (you will make a 'cardan' shaft with it) from sprue and carefully remove any flash. Cut shaft to length so that overall length is slightly less than the overall length between the slots in the mounted u-joint cups. Allow for some end play when assembled. Very carefully chamfer (taper) the end of the cardan shaft and, keeping the 'horns' in the same plane, push the cardan shaft into the horned ball hole (easiest if you leave it on the sprue until assembly is completed). This is a very hard push and if necessary you can tap the long shaft portion into the horned ball with a small hammer as long as you provide some support to the shaft to avoid bending. Remove the now assembled cardan shaft from the sprue and inspect. Remove trucks to install the cardan shaft and replace trucks - spin motor by hand and check for and correct any binds, etc. Repeat for other end.

11. Solder lead wires. We use a good quality electronic solder (Radio Shack, etc.) which solders easily to the steel tabs on the trucks and frame. Tin the steel tabs first, then solder the wires. One wire goes to the steel tab supporting the headlight (or any connection to the frame - we have been able to solder directly to the frame by scraping the blackening off and tinning the frame with a large hot iron). The second wire goes to the steel tab on either truck. Check locomotive operation direction as in (1) above. In the event that direction is incorrect, the easiest method of correction is to unsolder the truck tab lead and exchange trucks end for end and re-solder. Solder additional wire from steel tab on one truck to the second truck for all wheel pickup.

12. Test run. To safely weight, if desired, run locomotive at 12 volts DC (use a voltmeter, be aware that most power packs put out substantially MORE than 12 volts at full throttle setting) against a stationary object so that driven wheels are spinning. Add weight until amperage reading is at or below maximum continuous rating of 0.5 amp for #161-4/#163-4 1836 flatcan motor.

13. Install superstructure.

14. NWSL also makes replacement nickel plated brass wheelsets to fit Athearn locomotives. The #7139-4 (40") and #7140-4 (42") are for outside bearing truck powered diesels. The #7141-4 (40") and #7142-4 (42") are for inside bearing truck powered diesels such as the SD40-2 and all the newer, upgraded design, plastic sideframe Athearn diesels. These nickel plated brass wheels are precision machined for concentric running and are not as prone to collecting track dirt and gum as the stock Athearn wheels seem to be. If your locomotive uses and falls as it proceeds, a wheel (or more) is eccentric and replacement will provide smoother operation and better tractive effort. The prototype uses 40", most Athearn diesels use 42" - either size is available from your NWSL hobby dealer. Wheelsets are also available for unpowered diesels - #7129-4/#7130-4 for inside bearing (plastic sideframe), #7109-4/#7110-4 (older) outside bearing.

ATHEARN is a registered trademark and is used here solely to identify their fine products.

7-86C

NORTHWEST SHORT LINE BOX 423
SEATTLE WA 98111-0423 USA