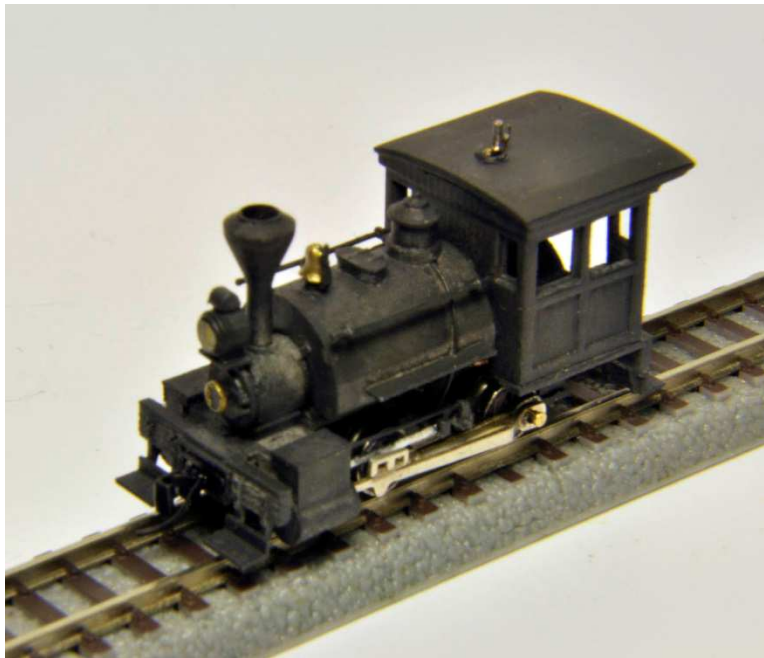
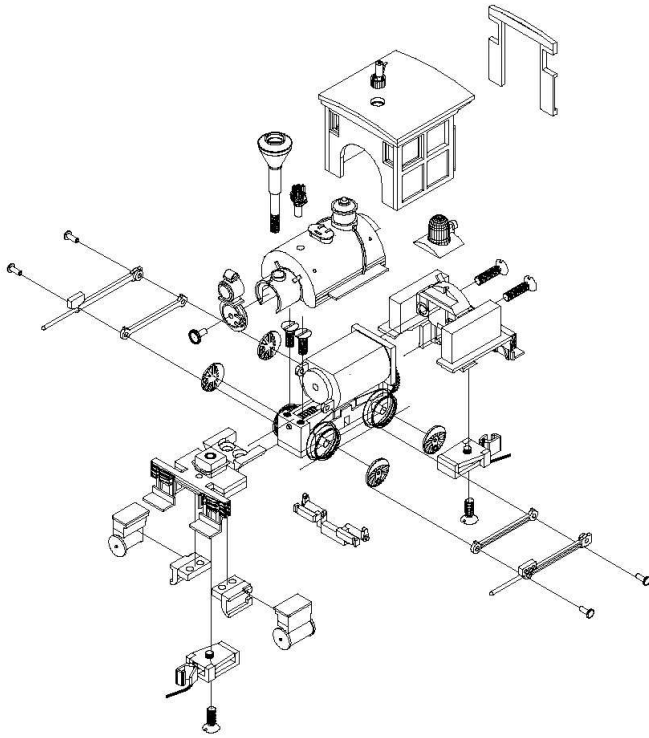


**SEARAILS RR-XXX
0-4-0 STEAM LOCOMOTIVES
ASSEMBLY MANUAL**

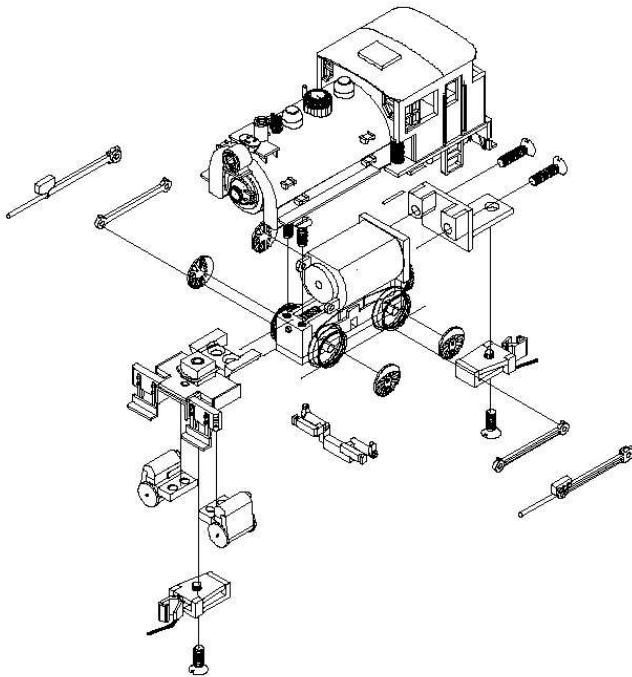


**30 March 2015
T R Knapp Model Engineering**

ASSEMBLY MANUAL – SEARAILS RR-XX – 0-4-0 SYTEAM LOCOMOTIVES

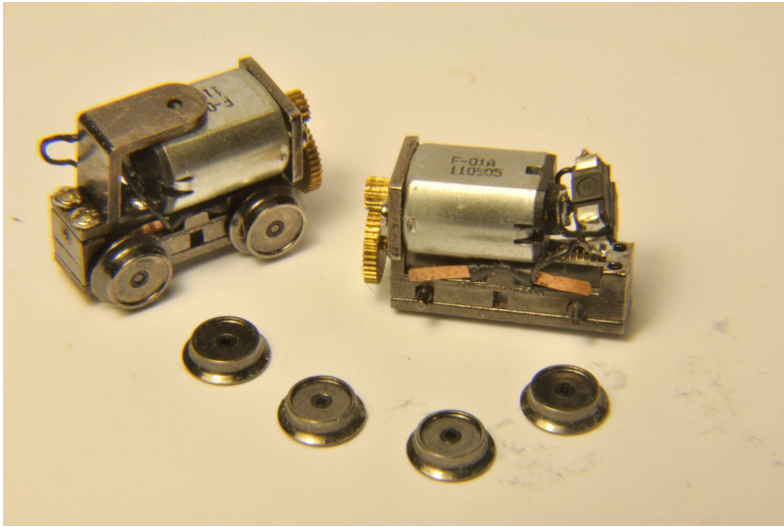


- 1 This diagram shows basic assembly of Nn3/Z Porter 0-4-0T

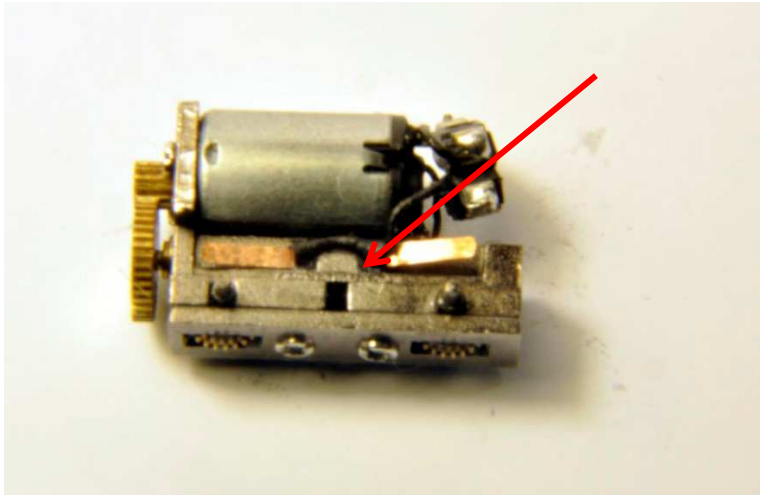


- 2 This diagram shows basic assembly of Baldwin "Dockside" 0-4-0T

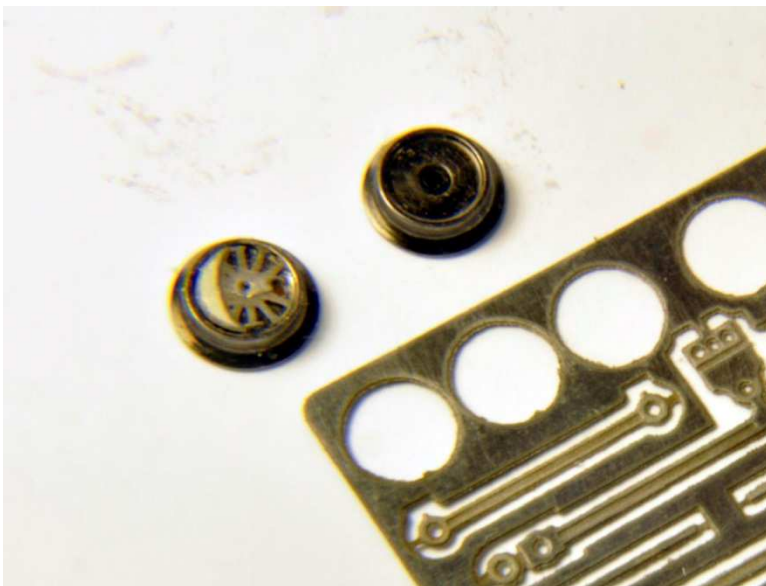
ASSEMBLY MANUAL – SEARAILS RR-XX – 0-4-0 SYTEAM LOCOMOTIVES



- 3 Pull drivers from ends of axles with axles still in PowerMAX! chassis.



- 4 Apply drop of CA to wiper insulating bushing to fix in place

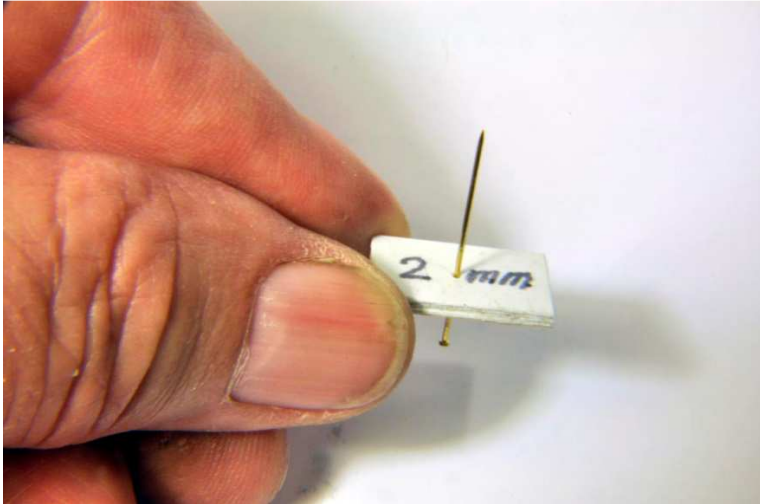


- 5 Cut driver center from etching fret; glue driver center etch in driver using SMALL drop of ACC glue.

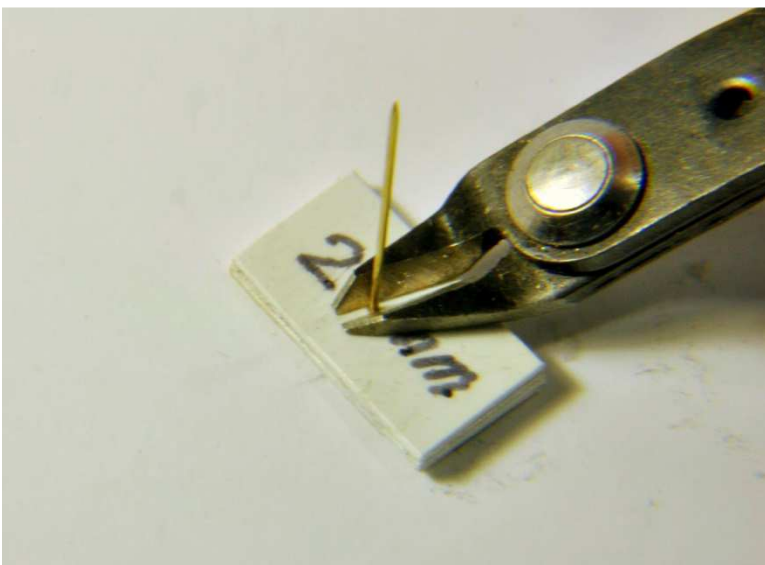
ASSEMBLY MANUAL – SEARAILS RR-XX – 0-4-0 SYTEAM LOCOMOTIVES



- 6 Drill with No. 76 (.5mm) drill. WORK SLOWLY – the hole intersects the stepped recess for the insulating bushing – if you are too aggressive, you will break the drill bit off in the hole, and then you are screwed!.

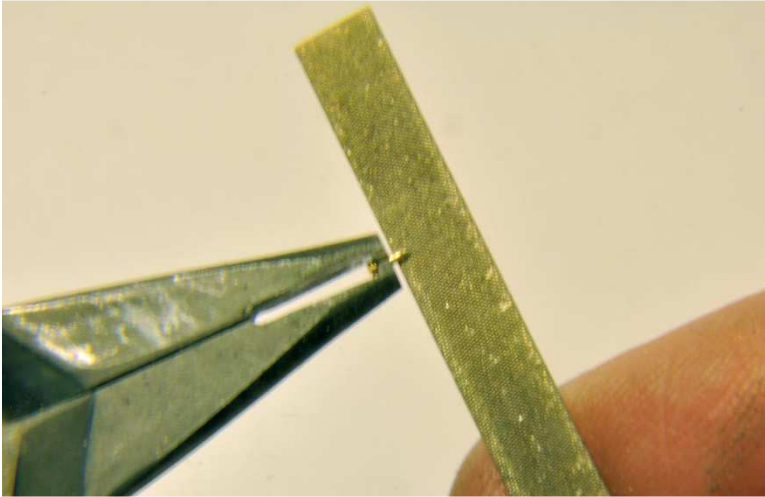


- 7 Cranks pins are to be made from brass pins (supplied.) It is suggested a jig be made from laminated styrene as shown.

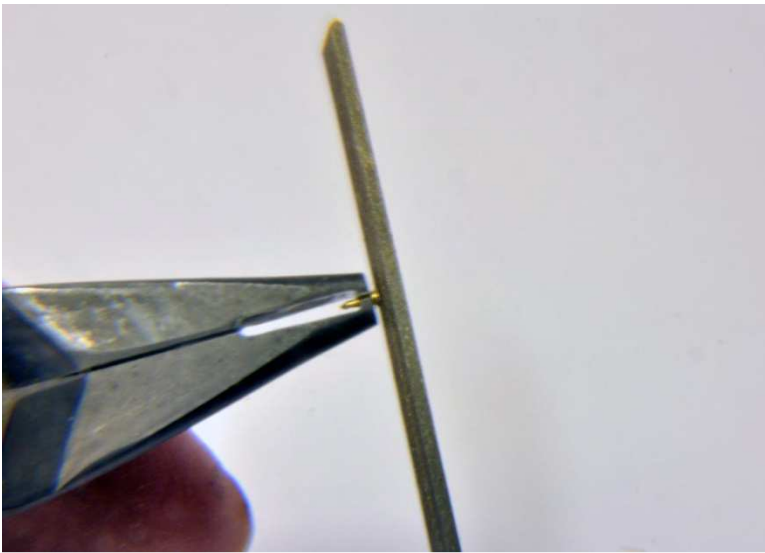


- 8 Place pins in jig, set jig on flat surface, and cut 2mm long crank pins

ASSEMBLY MANUAL – SEARAILS RR-XX – 0-4-0 SYTEAM LOCOMOTIVES



9 File end of crank pin into point.

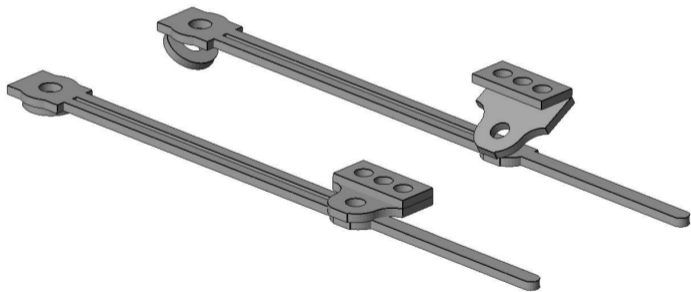


10 File face of pin flat.



11 Finished crank pin

ASSEMBLY MANUAL – SEARAILS RR-XX – 0-4-0 SYTEAM LOCOMOTIVES



- 12 Cut main and side rods from etching fret; fold main rod as shown above, and secure with CA adhesive.

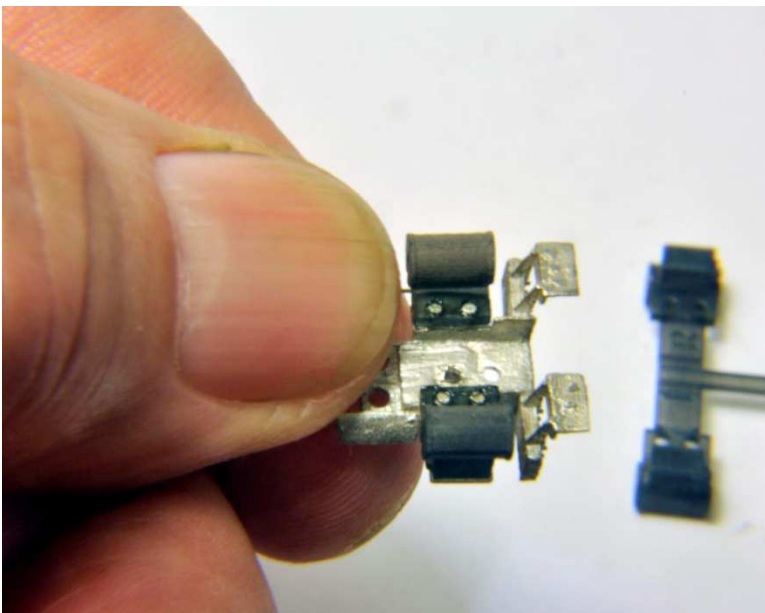
ASSEMBLY MANUAL – SEARAILS RR-XX – 0-4-0 SYTEAM LOCOMOTIVES



- 15 Crank pins pressed into drivers through side rod and main rod; there should be a little slop in the assembly.

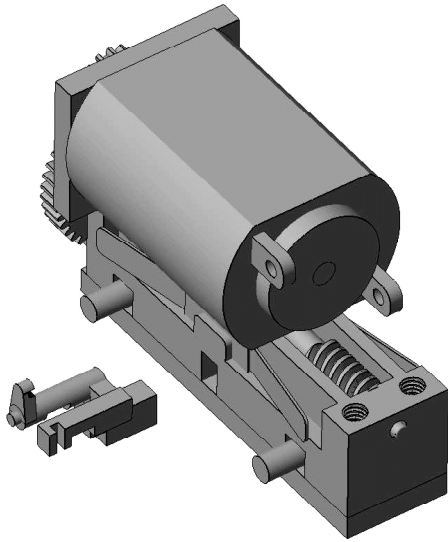


- 16 Rods and driver subassemblies; note slight offset bent into main rod to assure clearing crank pin in front axle.

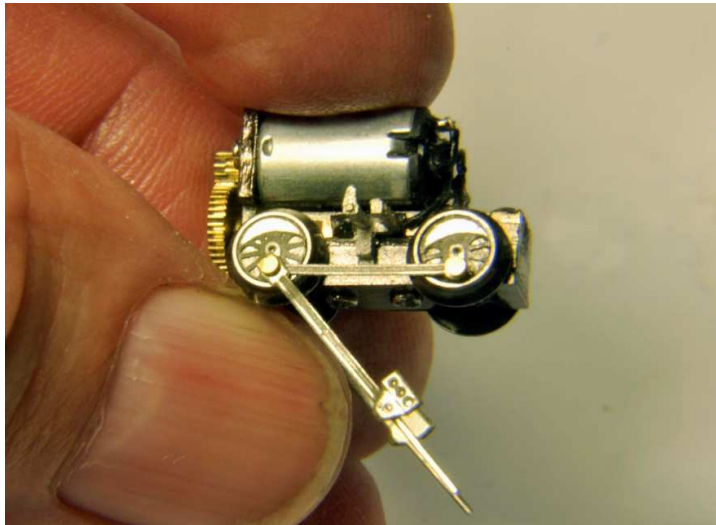


- 17 Press cylinder castings onto pilot casting; DO NOT FORCE – if too tight a fit, ream holes in cylinders.

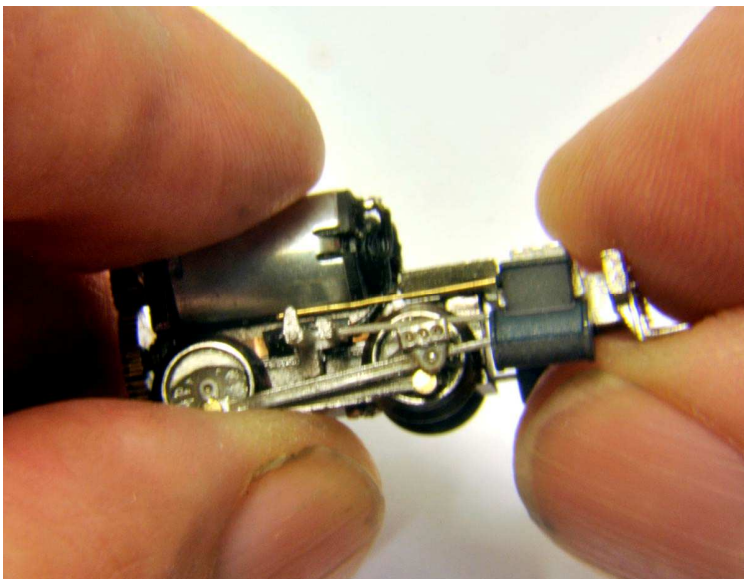
ASSEMBLY MANUAL – SEARAILS RR-XX – 0-4-0 SYTEAM LOCOMOTIVES



- 18 Press crosshead guide supports into chassis holes each side; apply SMALL drop of ACC to edge of hole to fix in place

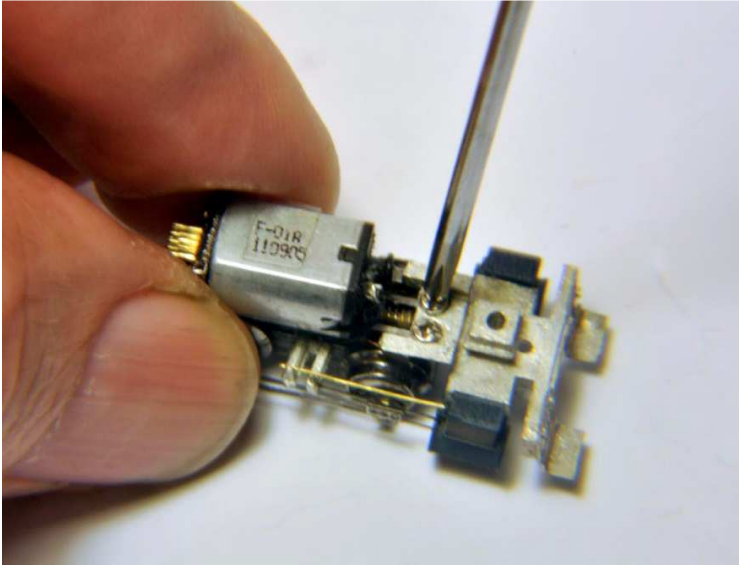


- 19 Press drivers onto ends of axles orienting each wheel to match crankpin location; offset opposite side by 90°.

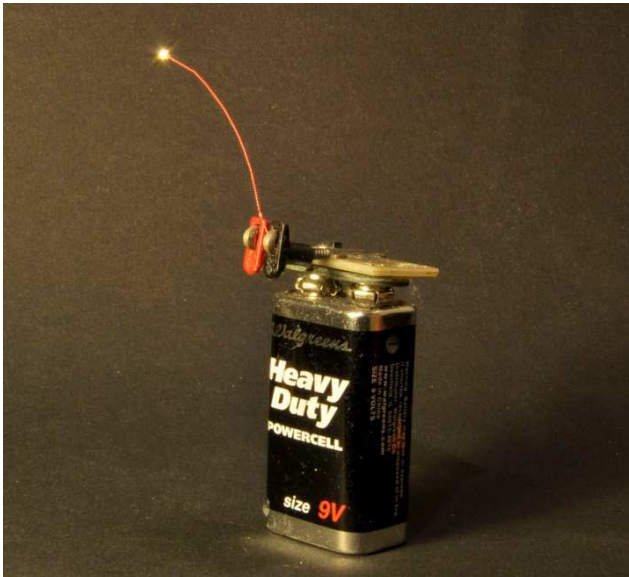


- 20 Slide piston rods into holes in cylinders as pilot is fitted to front of chassis. (Note: add etched crosshead guide and wire valve rod after step 20 at right.)

ASSEMBLY MANUAL – SEARAILS RR-XX – 0-4-0 SYTEAM LOCOMOTIVES



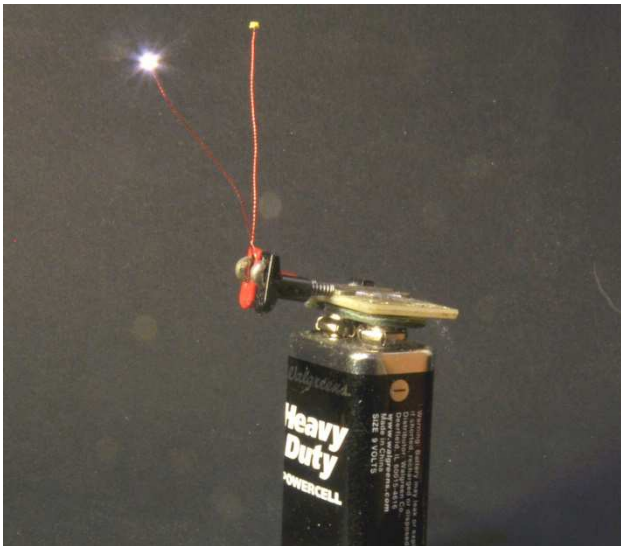
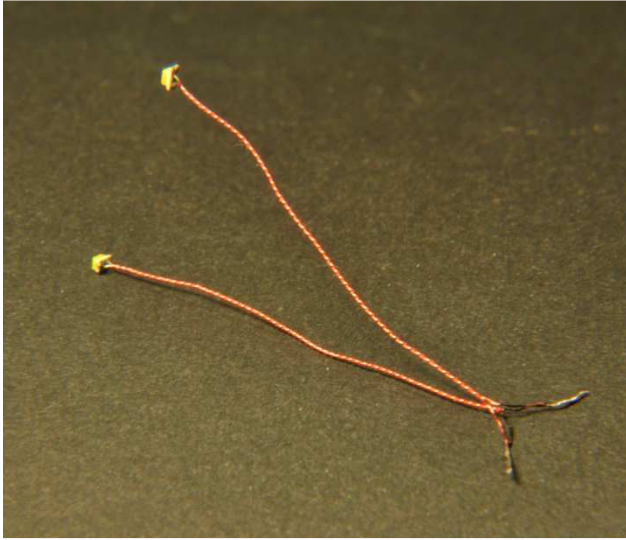
- 21 Fix front pilot in place with screws; cut length of wire and slip into valve rod hole on cylinder casting and glue in place at aft end; slip etched crosshead guide into slots and glue in place at aft end only.



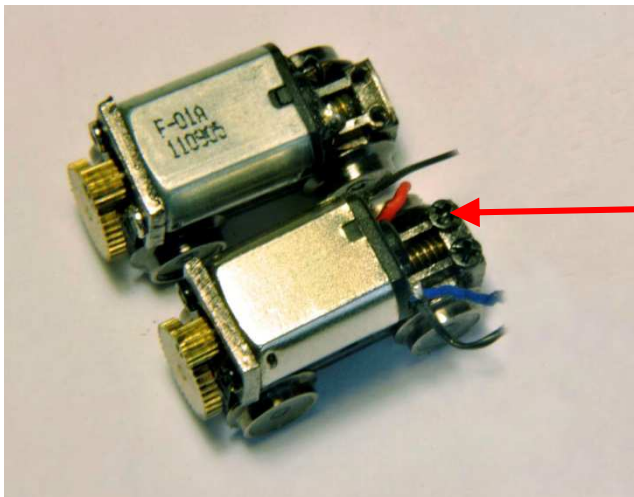
- 12 **Test** ALL LED lamps with N'gineering LED tester. (N'gineering LEDs have color-coded leads. Richmond controls LEDs will need to be marked after trimming to 1-1/2" length.)
Solder LEDs together in pairs, anode (+) to cathode (-).

- 13 Solder LEDs together in pairs, anode(+) to cathode (-)

ASSEMBLY MANUAL – SEARAILS RR-XX – 0-4-0 SYTEAM LOCOMOTIVES

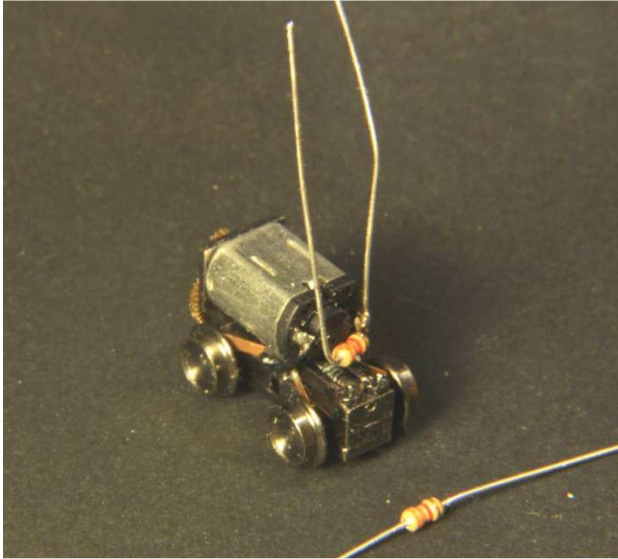


14 **Test** paired LEDs

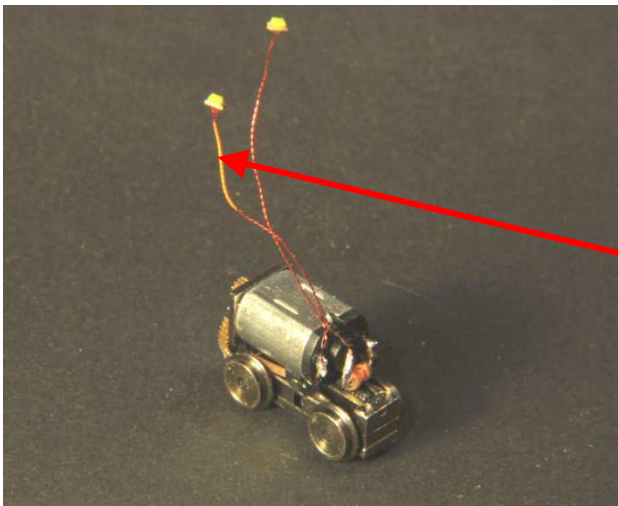


15 **Test** run each PowerMAX! both directions – set aside for repair any units which run erratically, unevenly or stall on turnout points; remove the two screws on the top of the chassis and save for future use. Lubricate with AeroCar ACT-2112 or ACT-3753 at drive gears and lay shaft bearings. Run to work oil around friction surfaces.

ASSEMBLY MANUAL – SEARAILS RR-XX – 0-4-0 SYTEAM LOCOMOTIVES



- 16 Bend resistor leads to form "U", and solder to one pole of motor; trim leads as shown in photo in step 17



- 17 Solder one lead from LEDs to resistor, and one to opposite pole of motor; make sure there is adequate separation between end of resistor and motor pole. (Note: Unit in this photo has already been tested and color-coded per Step 18.)



- 18 **Test** again, and mark LEDs for correct orientation; after testing, insulate LED solder pads with CA adhesive, Pacer Canopy Glue or Gallery Glass coating.

ASSEMBLY MANUAL – SEARAILS RR-XX – 0-4-0 SYTEAM LOCOMOTIVES

- 19 Fit fuel tanks: for Version 1, slide spigot into rectangular hole in side of chassis; for Version 2, hold chassis upside down in jeweler's vice, remove cover plate screws, remove cover plate and install new cover plate and fuel tank casting using original screws

- 20 Apply drop of CA adhesive in headlamp opening from inside, and slide rectangular LED into rectangular opening, holding until CA sets. (Use accelerator to speed up this process.)

- 21 After both lamps are in place, slip chassis up into body shell carefully, taking care not to pinch any of the fine LED leads, and making sure the leads do not foul the drive gears; attach chassis with two 00-90 x 3/16" flathead screws through fuel tanks
Test run locomotive to make sure lamps work correctly, and locomotive is level on rails

- 22 Trim one MTL 905 coupler box back to paper thin with motor tool, or cut away completely; mount this coupler to end of locomotive with large lay-shaft gears using MTL Z/Nn3 coupler mounting screw, making sure there is clearance between coupler box and gear; attach another MTL 905 to opposite end of locomotive.
Test run locomotive again.
PAINTING OPTION 2: Mask

ASSEMBLY MANUAL – SEARAILS RR-XX – 0-4-0 SYTEAM LOCOMOTIVES

wheels and headlamps and
paint after assembly.
After paint cures, remove
masking and **Test** run
locomotive again.

ASSEMBLY MANUAL – SEARAILS RR-XX – 0-4-0 SYTEAM LOCOMOTIVES

RR-540 Parts List
 EMD40 - Z (6.5mm gauge)

	description	part number	qty	source	remarks
1	brass body casting		1	Udell	
2	brass tank connector castings		1	Udell	
3	PowerMAX-6.5	RR-153S	1	KK	
4	resistor	3.3KEBK-ND	1	Digikey	
5	pre-wired 0603 LEDs	don't know number	2	N'gineering	1-1/2" wire leads
6	couplers (and screws)	002 02 021	2	MTL	1/2 package
7	screws 00-90 x 3/16	F0090B188	2	J I Morris Co	144 per package
8	instructions insert				
9	die-cut package insert				