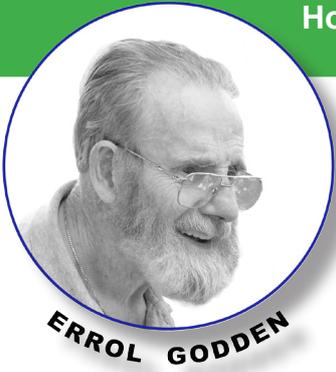


# CLOCKWORK SPRING REPAIR

## Hornby 501 Clockwork Spring Repair



**Firstly, DO NOT undo the lugs that hold the tinplate body together as they usually break off..**

- 1 Remove Control knobs
- 2 With small side cutters, lever out and remove crank pin nails.
- 3 Undo 2 Meccano square nuts that hold mech into body. DON'T lose nuts, flat washers and spring washers.
- 4 Take a business card and slip it under cab roof above control rods to stop rod ends scratching the under roof paint.
- 5 Lift out mech and withdraw control rods.
- 6 Remove control rods from mech, for ease of handling.
- 7 If mech is dirty, wash well in kerosene.
- 8 Take a mental note or do a quick sketch of the direction and location of outer spring end tether point.
- 9 With mech out of body, use a small screw driver to prise spring outer end away from its spacer mounting.
- 10 Take some 1/16" diameter soft mild steel wire and slip it through spring eye, twist 2 ends together and hold firmly in bench vice. With leather gloves on or old towel wrapped around the mech, walk backwards from vice until the broken spring fully leaves the mech.
- 11 Collect spring and put aside.
- 12 With Hornby key and long-nose pliers, attack remaining piece of spring and get as much out as possible. The end should be soft and easily straightened. With the same pliers, turn Thead spring anchor 90° and broken spring piece should be able to be lifted off T-head.
- 13 Check how much spring broke off. 2-3" is OK. These springs usually break where the annealed (softened) spring and the tempered (hardened) spring meet.
- 14 With the key in the mech, check that NO gear teeth are damaged and that the mech wheels spin freely.
- 15 With a piece of 6" long, 3/4" PVC electrical conduit or steel tube, slip it over the outer end of the spring and slide it all the way along until only approx. 3" of the broken end sticks out. This tube makes a very good handle to allow you to hold the spring without drawing blood!
- 16 Annealing (softening) - Use a Port-a-gas flame or gas-stove burner to heat the broken inner end of the spring to a cherry-red heat holding the spring with pliers but do not melt or burn the PVC tube, then slowly remove the spring from the flame and allow it to air cool. Then trim the broken end square and nick the corners off with tin snips or a file.
- 17 Clamp the spring end to a piece of wood to allow drilling the hole safely.
- 18 Next job is to drill the hole in the end of the spring. Drill a 5/32"(4mm) diameter hole approx. 3/8" (10mm) from end of the spring.
- 19 With a small round file (rat tail) elongate the hole to 1/4" long (6.2mm) Thus the hole in the end of the spring is now 5/32" (4mm) wide and 1/4" (6.5mm) long. This should now fit over the T-head of spring anchor.
- 20 Next with small pliers, put a small bend in the repaired end of the spring.
- 21 Next feed spring correctly into place over the T-head and with pliers turn

T-head 90° to spring. This stops the spring from coming off the T-head and the winding centre of the No. 1 gear shaft.

22 Then with a Hornby key, start winding the spring into the mech (spring feeds through the tube). Before the outer hooked end becomes hooked on the tube, slide the tube off and carefully wind the rest of the spring into the mech and hook the end over the spring anchor post. Refer to point 8.

23 Then with light machine oil, lubricate all bearing points, governor and spring.

24 Test mech for operation a few times.

25 Mech should now be ready to fit back into loco body after refitting the control rods.

26 Place business card inside cab under roof and proceed to slide mech and control rods back into position.

27 Then replace flat washers, spring washers and 5/32" square Meccano nuts onto the mounting screws.

28 Next refit brass control knobs and remove business card from inside cab.

29 Then refit side rods. The short pins go into the front wheel crank-pin holes to locate the coupling rods.

NB: the coupling rods have a round hole at one end and an elongated hole at the other end. The round hole goes to the front driving wheels and the elongated hole to the rear free axle wheels.

These crank pins may be squeezed with a pair of pliers or tapped with a small hammer onto a support at the back of the wheel (use a piece of 1" angle steel held in bench vice to support the back of the wheel) If you hammer the crank pin in without supporting the wheel back you may bend the axle.

If the crank pins are loose in their holes, a tiny drop of Loctite 609 or similar, put into the crank pin hole with a tooth pick, will secure the crank pin upon curing of the Loctite. Fit the long crank pins in the same manner after feeding the piston rod into the cylinder. Leave for 10 minutes and the loco should be ready to run.

30 Wind partly and spin the wheels to be sure they run reasonably true. If it is not OK, again use the long nose pliers, gently squeeze the appropriate section of wheel against mech frame to true up wheel. Axles are only mild steel and will bend slightly very easily. Next, rewind and test on track.

The above method can be used for repairing the broken spring on most 4-wheel clockwork mechanisms. Most springs tend to break at the inner end, if the spring breaks in the middle, then a new spring will need to be sourced and fitted.

"Good luck with your spring repairs"

by Errol Godden "Golden Hall of Fame" member VMR



Photography Mark Hobson