Toy Train Motor Refurbishing Instructions
Using TTRP SL-52 Bearing Studs & Tools

The following instructions are provided to assist you in disassembling your Lionel motor, installing new bushings using the STX-SL90 Flaring tool, and reassembling your Lionel motor using the SL-52 Bearing Studs and related tools. Please contact us should you have additional questions. These instructions are intended to provide general techniques and to demonstrate proper use of TTRP tools and motor repair tools.

1. Motor disassembly – remove all parts that are held on with screws such as the brush plate (remove armature), armature bearing plate and gears, etc. Wheels must be removed and we recommend using a wheel puller, always pulling the non-gear wheel. To disassemble the motor, you will drill out the ends of the SL-52 Bearing Studs (these are the steel posts that hold the motor together).

2. Side plate disassembly – to remove the original SL-52 bearing studs to open the motor, you must drill out the ends of the SL-52 bearing studs so that you can pull the side plates apart without bending them. Carefully drill the end of the SL-52 bearing studs with a #13 (0.185) drill. Do not drill so far that you remove any material from the side plate. Once this is completed, pry the side plates apart (a pair of Proto 251R Lock Ring Pliers are perfect for this application). Remove any studs which remain attached to the plates with a knock-out punch.

3. Remove field – once the motor is completely disassembled and the old bearing studs are removed, you will need to remove the field. The field is mounted to the geared side of the motor plate with four brass studs. Drill each of the rolled tips with a 4-40 drill. The field will be gently pried off, and will be re-installed with the same mounting studs. Place a flat blade screwdriver between the field and the side plate, near the mounting post. Gently ROTATE the screwdriver and the brass post will pop out of the side frame. Repeat this for all four posts. (Again, a pair of Lock Ring Pliers is perfect for applying even pressure to detach the studs).

4. Remove old axle bearings –Using a #13 (0.185) or a #12 (0.189) drill, drill each bushing to a depth of 1/32” to weaken their grip on the side frame. You can then knock each bushing out from the outside of the plate with a flat punch, or grasp the bearing with a heavy pair of pliers and remove by pulling to the side. You are drilling the bearing from the inside where the rim is flared out to grip the side plate (bearing plate). Once the bearings are removed, clean and rewire the motor as necessary.

5. Install new bearing – the new SL-90 axle bearings are installed from the inside of the motor side plate. The bearings are affixed to the side plate by flaring the outer rim, once the bearing is inserted through the plate. To do this, use the STX-SL90 Flaring Tool in your rivet press. With the bearing inserted in the side plate (bearing plate) and resting on a solid surface, lower the STX-SL90 Flaring Tool in to the center of the bearing from the inside and press the tool into the bearing. This will flair the outer edge of the bearing into the plate, holding it in place.

If the armature bearing needs to be replaced, the procedure is the same, using the STX-SL22 Flaring tool (picture shows and SL22 armature bearing being installed in a Lionel 150 series humpback motor).
6. Re-install the field – once the bearings are installed, the field will be reinstalled. Place the field in position so that the brass mounting posts are in alignment with the original holes in the side plate. Use a pair of large pliers (Channel lock type work best) and gently press the field posts back into their original holes. You will usually hear them “snap” back into place. Once they are tightly in the holes, re-flair the ends of the brass posts with the STX-SL52 Clincher. Make sure each post is rigidly attached to the side plate.

7. Reassemble the motor – with the field reinstalled, you are now ready to reassemble the motor. Prior to doing this, you may want to rewire the pickup assemble and install a new wire on the field coil. To reassemble the motor, you begin by installing the SL-52 bearing studs to the brush-plate side of the motor. To do this, install the STX-SL52 Anvil in your rivet press. Insert the SL-52 bearing stud in the anvil, and then place the aide plate over the end of the SL-52 stud. Use the STX-SL52 Clincher to flare the end of the SL-52 bearing stud and affix it to the aide plate.

8. This picture shows the brushplate side of the motor with the three SL-52 bearing studs installed and the geared side of the motor with the field installed. Note the new SL-90 axle bushings. The STX-SL52 Clincher and the STX-SL52 Anvil (with a bearing stud inserted into it) are also pictured. Once the studs are firmly mounted in the brushplate side of the motor, carefully assemble the sides of the motor, including the pickup assembly and mounting brackets, if applicable. Turn the motor over and flair the other end of the SL-52 bearing studs to complete the job. You may hold the motor together with a large spring clamp to complete this final step.

Once you complete a few of these, you will find that the entire job can be completed in about thirty minutes. The operation of your motors will improve markedly and axle bearing replacement will become a routine process as you refurbish these old motors. Remember, the first time is probably the most difficult, so take your time and enjoy yourself!

Some additional pictures:

- Bearing installed (view from outside)
- Bearings installed (inside view)
Assembled motor with new bearings

Proto 251G Lock Ring Pliers (reverse action)