

Repairing the Voice of Music Idler, P/N V.M.-35429-M.R.

Since you're reading this, you are likely familiar with this part used in many vintage 4-speed record changer mechanisms and how the soft rubber loses its suppleness over time, eventually becoming "hard as a rock." This deterioration inevitably leads to the inoperability of the mechanism due to friction loss, so replacement of the part is required. Unfortunately, as is the case with many obsolete items, the original part is unlikely to be available at a reasonable price, leading to the alternative of either spending \$40 or more to have the original idler "rebuilt," or somehow doing a workaround. While others have reached the conclusion that there is little chance of a "hack" of the wheel working reliably in the long term, I believe I have figured out a way to do it, as described in this document. It is a relatively easy procedure that the average person should be able to do if the instructions are followed carefully. Before getting into the repair, let me just add that the changer you are working on likely suffers from other age-related problems in addition to the hardened idler wheel. These typically involve hardened grease that restricts the free movement of key parts of the mechanism and perhaps a deteriorated crystal cartridge that results in little or no sound from the speaker. While these issues are not addressed here, it is good to know what to look for should the unit still not function properly once proper drive to the platter has been restored.

Let's begin with what you'll need to assemble in preparation to repair the idler.

Materials Required

Metric nitrile (Buna-N) O-ring #326 (JIS type G45) measuring 44.4mm x 50.6mm x 3.1mm (1-5/8" x 2" x 3/16"), available at auto parts stores or included in some large assortments, such as sold by Harbor Freight Tools. Having this exact part is critical.

Liquid "Super Glue" (cyanoacrylate adhesive). Substitutes aren't advised

Extra-fine sandpaper (220-grit or higher)

Rubbing alcohol

Wax paper or plastic wrap

Piece of corrugated cardboard and empty can or jar with 1-1/4" or larger opening

Cellophane, masking, or similar tape

Piece of small-gauge wire and/or

Paper clip

Tools Required

Scissors

Wire cutters

Needle-nose pliers

Small, flat-blade screwdriver

Small block of wood or similar item with two perfectly perpendicular edges

If the idler wheel has not yet been removed, this should be done in the following manner:

1. Remove the retaining ring from the bottom of the record spindle. This may be a tiny o-ring that must be carefully stretched and slid up and off, or a metal clip that is removed in a sideways motion.
2. Pull the turntable platter up and off the spindle. Make sure not to lose any metal washer(s) or ring bearing that may be adhered by grease to the bottom of the center bearing. Set it record-side down to avoid getting grease on anything.
3. Carefully remove the tiny circlip from the shaft above the idler. Be sure not to lose this part or the thin fiber washers above and below the wheel. Wipe off any oil residue that may be on the wheel bearing using a paper towel moistened with rubbing alcohol.

This procedure works only because of the close fit between the inside of the o-ring and the stepped portion of the rubber on the underside of the idler wheel. Before proceeding, you may want to confirm that this tight relationship exists between the two. You will be gluing the o-ring to the underside of the idler using this tight fit to automatically center the new “tire.” It is therefore important in the following steps that you are not overly aggressive with the sanding, which would alter the precise dimensions and lead to unwanted “slop” in the alignment of the two parts when put together.

1. In order to improve adhesion between the two surfaces, lightly sand the o-ring and the mating surfaces of the idler wheel. The latter include the outside edge and about 1/8” in from it on the bottom.
2. Clean the abraded surfaces with a paper towel moistened with rubbing alcohol and let dry.

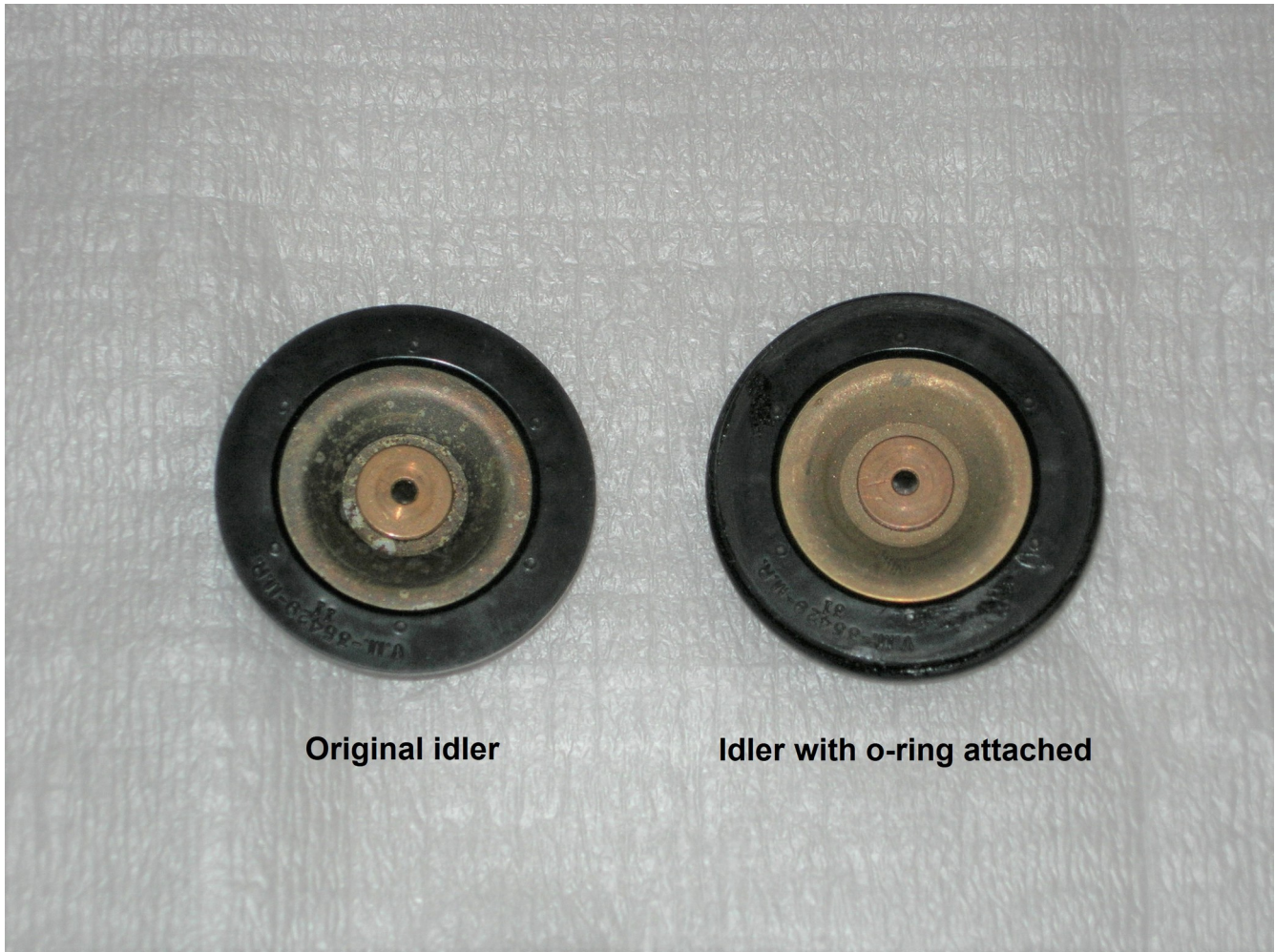
In the actual assembly, you will be placing the underside of the idler containing the adhesive on top of the o-ring. Since the former has both a shaft and a “bumpout” that would prohibit it from settling against the latter, a small work surface will need to be constructed that will support the o-ring while letting the protrusions pass through. It also needs to have something of a non-stick surface, should oozing adhesive contact it.

1. Cut a piece of corrugated cardboard to roughly 4” x 4” in size.
2. Cut a piece of wax paper (or plastic wrap) to a slightly larger size.
3. Place the former in the center of the latter, fold over the edges of the paper/plastic and secure it to the cardboard with tape.
4. Draw in the center of the cardboard a circle about 1-1/8” in diameter and cut this out, both in the cardboard and the wax paper/plastic wrap. Do not cut into the circle from an outer edge of the cardboard.
5. Place the assembly, cardboard and taped surface down, centered on top of a suitable jar or can. Ideally, the opening of the latter should be between 2 and 3 inches in order to offer good support for the wheel.

Because the idler will be placed on top of the o-ring bearing side down, a way is needed to hold onto it while lowering it into position. To accomplish this, cut a piece of paper clip or similar-gauge wire about 2” long and center it through the hole in the bearing. Using pliers, make a 90-degree bend in the wire about a quarter inch in from each end. This will result in a piece of wire that slides back and forth without falling out. You are now ready to perform the actual assembly. Be aware that the adhesive is especially good at sticking to skin, so wearing eye protection and medical-type gloves would be a good idea. Also note that it is fairly fast-setting, so you won't want to dally once the glue has been applied to the idler.

1. Place the o-ring on the previously-prepared work surface so it is centered around the hole.
2. With the idler held by the wire with its underside facing up, apply a continuous bead of adhesive to the area between the outer edge and the “stepped” portion of the wheel.
3. Grab the wheel by its bearing and let the wire drop down, then grasp the lower end of the wire and flip the idler over so it's rightside-up.
4. Holding it by the wire, carefully lower the idler, keeping it centered over the o-ring below.

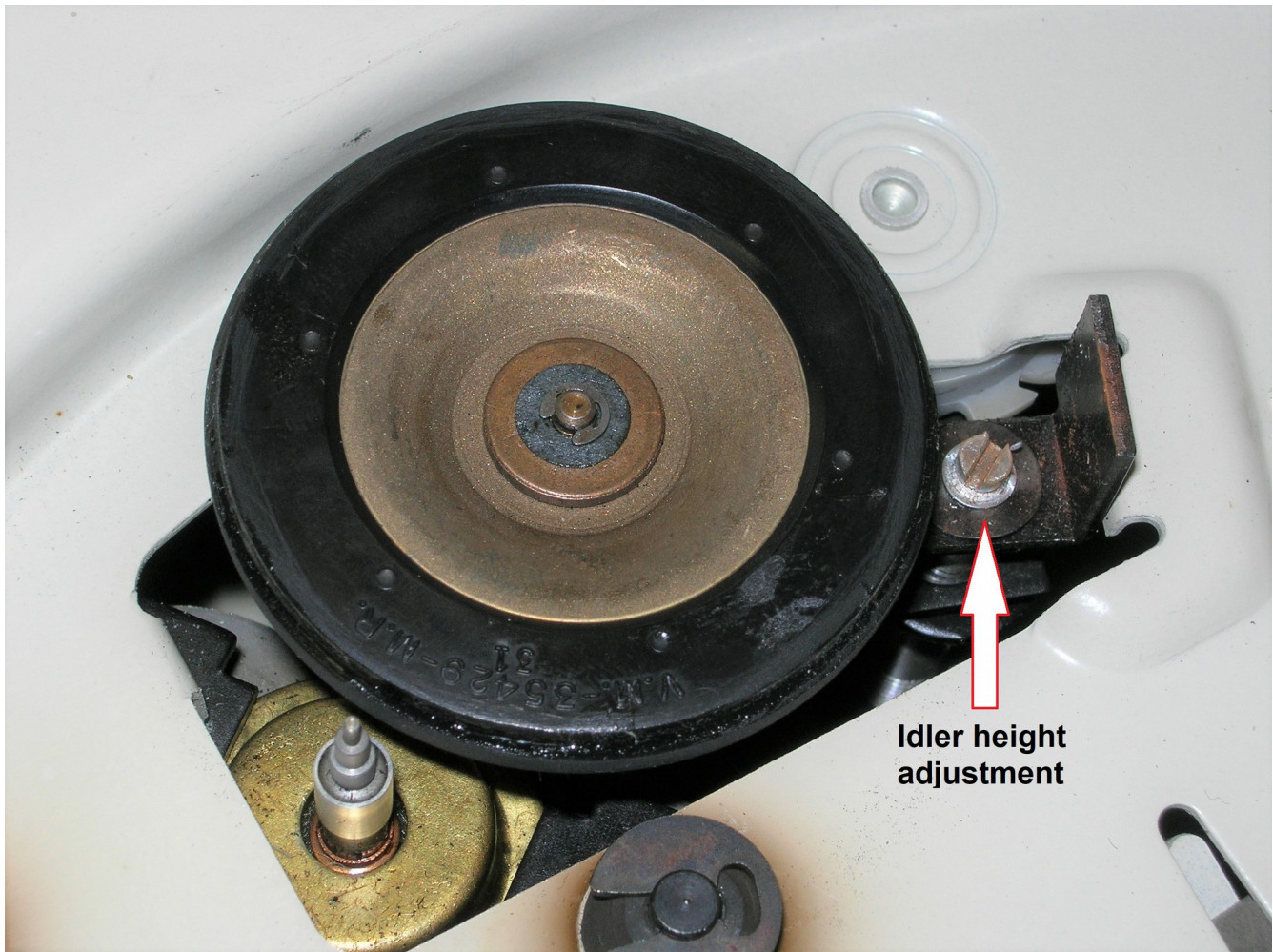
5. Once the two parts have made contact, use your fingers to place a little bit of downward pressure on the wheel. Check to be sure that the amount of o-ring visible around the circumference appears to be uniform and that there is no visible gap between the two surfaces all the way around. Continue to maintain the light pressure for a couple of minutes until the glue starts to set up.
6. Allow the adhesive to dry undisturbed for an hour before removing the wheel from the work surface. Depending on the quantity of adhesive used, you may wish to add additional strength by applying a thin bead of glue top and bottom where the o-ring contacts the idler.
7. Allow at least 3 hours for the glue to dry before proceeding.



If you have a mechanical inclination, perhaps you've figured out that adding the o-ring presents three problems: it has reduced the height of the idler's driving surface; it has increased the outside diameter of the idler; and it has reduced the surface area of the friction drive due to its rounded surface. All three issues will be resolved in the steps that follow. The piece of wire through the bearing may be removed and the idler reinstalled on its shaft. It may be wise to clean and re-lubricate the fiber washers, bearing and shaft before doing so. Take care when re-installing the tiny retaining clip, as it is easily lost and difficult to find a replacement for.

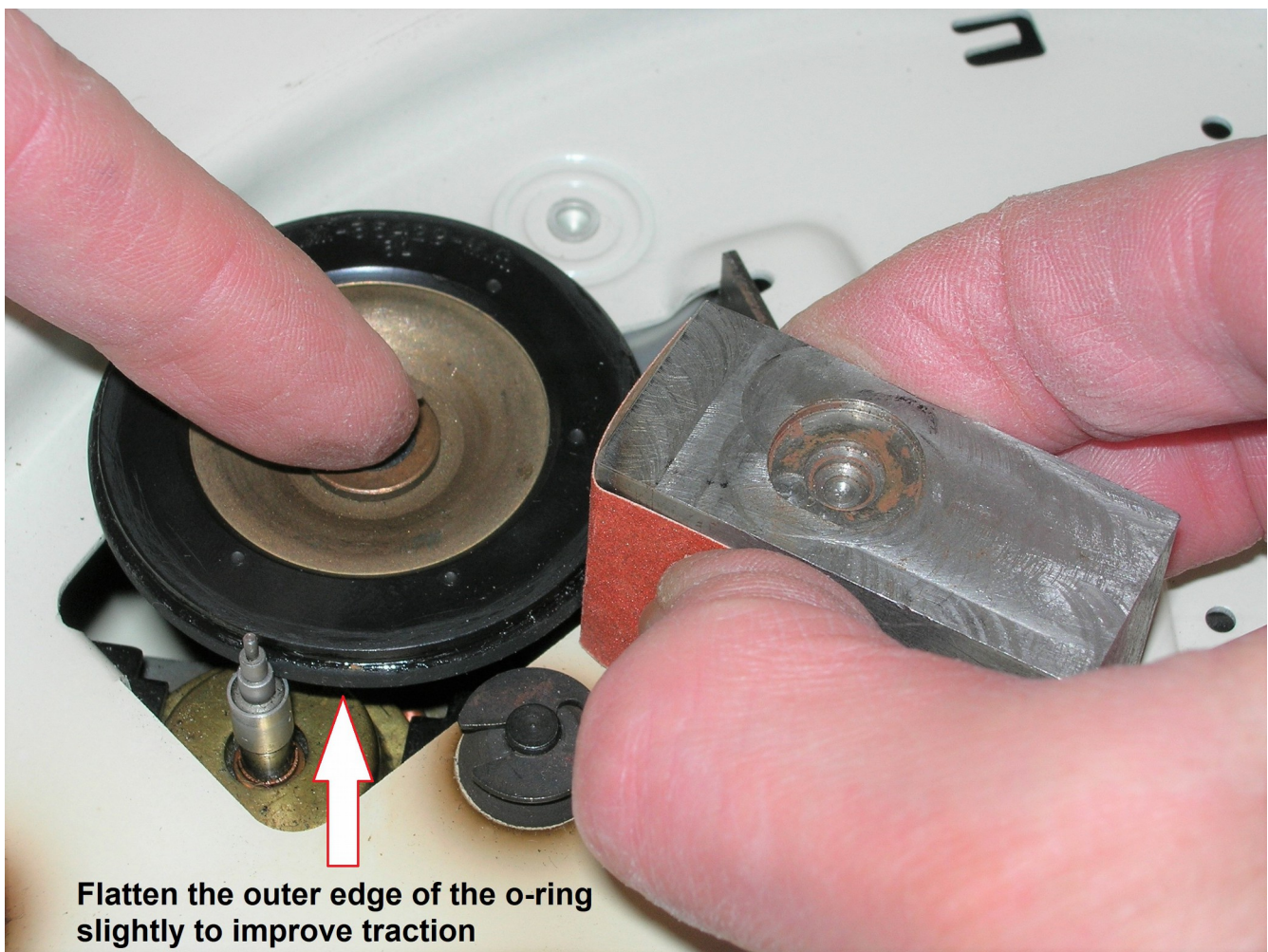
IMPORTANT: in the following steps, do not apply power to the motor unless the idler is prevented from contacting the edge of the changer deck. Otherwise, damage may occur to the outer edge of the o-ring during a “jam.”

The change in height will be addressed first. Note that the top of the round shaft on which the assembly containing the idler is mounted is slotted at the end. This allows the shaft, which is threaded below like a screw, to be turned with a screwdriver in order to adjust the height. With the speed selector set to “16,” turn the slotted shaft counterclockwise to raise the idler until the o-ring lines up properly with the center of the thinnest (uppermost) portion of the “stepped” motor shaft. This will be fine-tuned later on.



In order to provide adequate “traction” between motor and wheel, it is necessary to slightly flatten the rounded outer edge of the o-ring. In order to achieve as straight a “face” as possible, you’ll need something that has perpendicular edges to serve as a guide and backing for the piece of sandpaper that will be used to abrade the edge of the o-ring. The illustration shows a chunk of steel being used, but a piece of wood or even the (hard) plastic cap off a small-mouthed container may be used provided it fits into the limited space. A circular shape is fine as long as you have an edge that is perfectly vertical. A small piece of sandpaper is then wrapped around this guide and the two held lightly against the turning wheel in order to (slowly) remove some of the material. To accomplish this, the changer should be set for “45” and the wheel held against the spinning motor shaft by a finger pushing against the idler’s shaft. The position of the sandpaper can be changed periodically to expose fresh abrasive. You will only want to remove enough material to create a “flat” edge of about 1/16” in height. When finished, clean the outer edge of the o-ring using a paper towel moistened with alcohol.

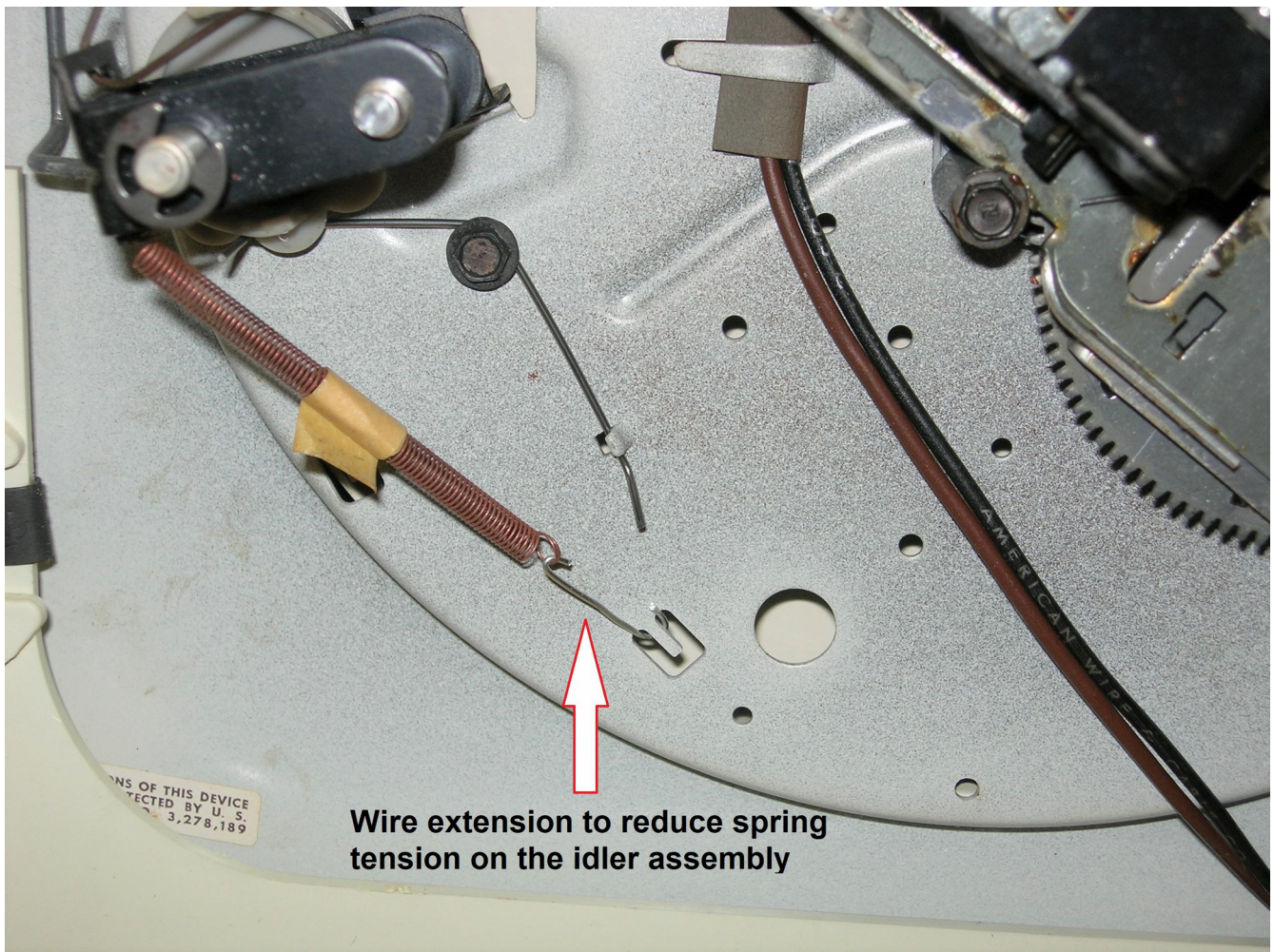
The height of the idler wheel with respect to the 3 upper steps in the motor shaft should be rechecked and any fine-tuning of the adjustment performed. It’s important that the height be sufficient to prevent the o-ring from rubbing against the adjacent section of the shaft.



The turntable platter may now be reinstalled, preferably after cleaning any hardened grease from and re-lubricating the washers, ball bearing and shaft bearings. For those unaccustomed to working on these changers, it should be noted that in order to install the platter the sliding tip at the end of the record stacking spindle must be in the raised position. One way to accomplish this is to hook a piece of thin wire through the slot in it, thread the free end up through the platter and then pull lightly on the wire as the platter goes over the spindle. As the idler wheel will likely be resting against the changer deck, you will want to push this in with a finger as the platter is lowered. Rotating the latter can help with this process of tucking it inside.

As noted earlier, the diameter of the repaired idler is larger than it was initially, which creates some additional pressure against the motor shaft. This will likely slow it down by a few percent. To counteract this, the tension provided by the coil spring connected to the idler assembly on the underside of the mechanism should be reduced. To do this, cut a piece of paper clip and form a hook at either end. The overall length of the finished piece should be about 7/8 of an inch. This extender is then placed between the end of the spring and the point on the deck it connected to. Bend the wire as necessary so that the line of travel is fairly straight.

(illustration on the the following page)



Wire extension to reduce spring tension on the idler assembly

I hope these instructions have been helpful to you. As noted at the beginning, your changer/phonograph may have additional age-related issues, but at least you will have made a good start in the restoration process.