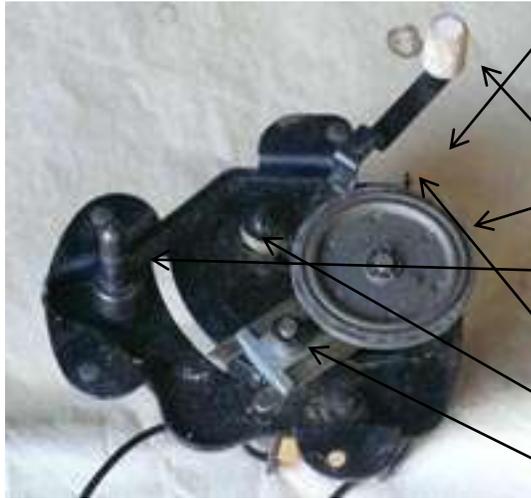


## GENERAL INSTRUMENTS PHONO MOTOR SERVICE



This is a typical phono mechanism for the GI synchronous phono motor for 3 or 4 speed phonos.

Shift lever

Rubber faced Idler wheel.

Center spindle

Stepped motor shaft

Rubber isolation motor mounts

Idler shifting mechanism

The Alliance motor system is very similar in physical mounting holes and uses the same stepped armature shaft to change speeds. Typically, the idler (drive wheel) is 2" in diameter for both styles.

This is an article for the General Instrument system which is universal to the Alliance system with the exceptions of a few minor things. These will be covered in the next edition for Alliance Phono Motors.



Identification can be made by looking at the bottom bearing on different motors. The Aluminum casting sports the GI logo and on the other side is the bronze bearing with a felt that should be saturated when oiling. This will be covered later



This shows the idler removed.

Note the clip to hold it on the shaft with a paper washer.

This is the idler mounting mechanism which slides back and forth and is spring loaded to hold the idler against the stepped motor shaft.

Idler shaft.



At this point you can see the deteriorated motor mounts. Three in all.

Idler shaft.

Tension spring

With the idler assembly removed, it is easier to see the full extent of the deteriorated mounts and the dirt accumulation of 50 years.



Do not be surprised if some parts do not move smoothly. The lubriplate used 50 years ago usually has turned to hard clay by now and may need a penetration liquid to soften it enough to remove some sliding parts.

Look closely at the front motor mount. It has collapsed and the motor is sitting at an angle with the shaft pulled away from the idler. This alone is

enough to stop the turntable platter from moving at a constant speed as the motor shaft slips on the drive wheel due to lack of a tight contact.

I am removing the motor mount screws, washer, spacer and nut. The two mounts on each side of the motor shaft have long screws that go all the way from the top, through a washer, through a spacer which after the screw is tight, keeps it from compressing the rubber mounts. They are there for the motor to sit in and this cuts down the motor noise from being



transmitted mechanically to the motor plate which holds the center spindle and the turntable platter. If the mounts were not present or had hardened, you would hear the motor noise being picked up by the needle, amplified and sent to the speaker along with the sounds from the record.



The GI motor has been removed from the motor plate. Note the rubber mounts condition. To the left of the motor are the screws, washers, spacers and nuts. Above them is the idler mount mechanism. A close look at the left side of the motor mount you will see the stepper that moves the idler up and down to match the steps on the motor shaft. Of course, on-line, you can click on the pictures to get a larger view.

**Note: the top bearing structure is also aluminum.**

When doing a reconstruction of the motor, always lay it out on a white paper to keep things organized and together. Nothing is more exasperating than losing a small part on the floor and wasting time looking for it.



I always use a permanent marker to mark one side of the motor and upper and lower bearings. This enables easy reassembly without guessing what was top and bottom. As a synchronous motor, if the upper and lower bearing were switched, the motor would run backwards.



Use a cue tip and alcohol to clean the bearing and friction surfaces. Remove all traces of the old oils on both the top and bottom bearing



After a good cleaning with alcohol, inside each bearing is a felt. Saturate the felt with machine oil on both bearings and leave a small amount on the shaft.



Using a paper towel or rag, clean the stepper portion of the upper motor shaft with alcohol. Leave no residue traces.

Remember, this is important for a good friction between the idler and the motor. If it has slippage, the platter will "WOW" or turn at erratic speeds.



New rubber motor mounts

Old deteriorated mounts.

The new mounts are inserted into the motor mount plate after it has had a good cleaning



The plate has been cleaned and the new mounts installed.

Now is the time to use a cue tip again to apply "Phono Lube" or "White Lithium" to all points of metal to metal contact.



The center spindle should be removed by taking off the clip on the underside and pulling the spindle upward. I have had the lube used in these so hard I had to soak them with MEK to get them to release. Obviously the turntable platter did not turn in these cases. Clean the inside of the bearing with a cue tip and alcohol and also the entire spindle. Relube it and reinstall. Don't forget to use the clip to hold in firmly.

The idler assembly has been cleaned and lubed. Note the spring assembly to hold the idler to the motor spindle when assembled.



Also note the lubricated places of metal contact.

The idler shaft will be cleaned and lubed just before assembly of the idler. The idler is one of the most important parts of this mechanism. Be super careful not to get any finger oil or lubricate on the rubber portion.



The screws are mounted from the top of the plate. Two are very long and go all the way through the motor bearings. Note the positions of the washer, the spacer and on the bottom bearing will be a lock washer and nut.



Once the screws are in place, on the bottom bearing use the locking washers and nuts. Use "Loctite" to make sure they do not vibrate loose. I know this sounds like a little "overkill", but experience has proven over the years that it will save you many hours of "re-do" down the line.



You should now have a clean working motor assembly.

The cleaner, the better, because dust will accumulate on any oily surface. This is why you do not see a lot of lubriplate spread everywhere as in the original assembly and I use machine oil sparingly.



Now is the final cleanup. Be sure to not touch the rubber on the idler wheel with your fingers after cleaning.

Use a sturdy paper towel or rag and alcohol to clean the face of the drive wheel. Rub hard until no black residue shows on the towel. Sometimes if there is a small divot in the rubber, I will mount it in my drill press and while turning, apply a 220 or so sandpaper to the surface to sand out the divot. A small change in the diameter of the wheel will

make no difference in the speed of the turntable.



Here is the finished product remounted using either nuts and bolts or "Pop" rivets.

Hopefully, it will be good for another 50 years.