Loose Tuning Pins

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Aside from normal fluctuations in temperature and humidity, the most common issue that adversely affects tuning stability on a piano is loose tuning pins. As a piano technician, it is not uncommon for me to attempt to tune an old piano and discover that the tuning pins are loose, which can be a serious issue. In this article we will look at what that means, how to avoid the issue, and options for repairing them.

First, we need a brief lesson on the anatomy of a piano string. A piano string is, essentially, just a thin piece of high-tensile steel wire that is stretched and held at the proper tension to produce the proper pitch. Each string starts at the hitch pin, passes over the bridge, through the agraffe or capo bar, and then is wrapped around a tuning pin that is driven into a thick piece of laminated hardwood known as the "pinblock." The pinblock is designed to grip the tuning pin very tightly in order to keep the string at a very high tension (roughly 160 lbs. of tension per string).

Tuning is, essentially, the art of adjusting the tension on each individual string to make each one sound at the correct pitch. This is done by means of turning the tuning pin one way or the other. As the string's tension increases or decreases, so does the pitch. A modern piano has over two hundred strings, and each must be carefully set at the exact tension required to make the piano sound "in tune."

Loose tuning pins happen when the pinblock is no longer holding the tuning pins tightly enough to maintain the proper tension. If a tuning pin is not tight enough in the wood of the pinblock, the tuning pin will slip and the pitch on that string will drop drastically. A very loose pin will not stay at pitch even for a moment, whereas a pin that is not as bad may hold pitch for days or even months after being tuned and then suddenly slip. Because wood shrinks when the humidity is low, loose tuning pins are most prone to show up in the wintertime when indoor humidity levels are very dry.

Loose tuning pins are most common on old, worn-out pianos. A large percentage of pianos built in the pre-WWII era suffer from loose tuning pins today. The issue can also occur in pianos that have been exposed to extremes in humidity, or that were poorly built to begin with. When a piano goes through prolonged extreme high humidity, the wood around the tuning pins can swell to the point of damaging the wood fibres, so that when the humidity goes down and the wood shrinks there is no longer enough friction to keep the pins tight. A poorly built pinblock may also crack or have other blemishes that affect the ability of the wood to hold the pin. Because the pinblock is completely concealed by the cast-iron frame on modern pianos, cracks cannot be seen directly and are only observable in the effect they have on tuning pin torque.

The best way to avoid loose tuning pins developing on your piano is to keep the piano from extremes in temperature or humidity. A humidifier during the winter time may be necessary in order to avoid the extremely dry indoor humidity levels that are common in our climate. If your piano is very old, however, the damage may have already been done, or it may be worn to the point where there is nothing you can do to help it.

A piano with loose tuning pins will usually have individual notes that sound severely out of tune compared with the rest of the piano. But ultimately, the only sure way to verify whether a piano has loose tuning pins is to have an experienced piano technician try them out. It takes a trained hand to feel whether a tuning pin is loose enough to be a problem.

There are several options for repairing loose pins, depending on the severity of the problem and the value of the instrument. If only a few pins are problematic, they can be repaired by removing the tuning pin and either shimming it or replacing it with a larger-sized pin. The complication with very old instruments is that the wire strings can become brittle over time from rust and corrosion, and there is a chance that strings may break in the process of such a repair. If several strings break in the process, this job can quickly turn from a simple repair to a more expensive and complicated procedure.

If the piano is of significant value, it may be feasible to rebuild the instrument either partially or fully. The most thorough method would be to replace the pinblock entirely as part of the rebuilding process. This procedure would be an option for large grand pianos only. (Most upright pianos or short grand pianos are not valuable enough to make a full rebuilding job financially feasible.) Alternatively, the entire set of tuning pins could be replaced with a larger size, usually along with replacing all the strings. Restringing the piano, while not a full rebuild, can give an older instrument a new lease on life. This is usually done in conjunction with refurbishing the action (replacing hammers, dampers, etc.). In both of these instances, the work would cost in the thousands of dollars, so the instrument would have to have enough value (either monetary or sentimental) to warrant the investment.

For a piano in which the aforementioned procedures are not feasible, a CA glue procedure is a very inexpensive alternative. This procedure involves laying the piano on its back (if it is an upright), and applying a very thin viscosity of CA glue at the base of each tuning pin. The glue soaks into the wood of the pinblock and tightens the wood fibres around the pin. After drying overnight, the piano is ready to be tuned and played. While this procedure is not 100% guaranteed to eliminate every loose tuning pin, it does have a high success rate. It is a very inexpensive method of attempting to extend the life of a piano that otherwise would not be tunable.

In some cases, sadly, there is no solution to the problem. If the piano is not worth rebuilding, and if the issue is beyond a simple fix, then the piano has most likely reached the end of its useful life. All good things eventually come to an end, and sadly that includes pianos. (For more on the subject, please see our article called “What is the Lifespan of a Piano?”.) In the end, it is always best to have your instrument assessed by a qualified technician who can determine the issues and advise on the best solution.