

The Buckeye Backcheck

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Newsletter of the Columbus Chapter of the Piano Technicians Guild

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The Teflon Question - A Presentation by Dr. David Snediker



The May meeting technical presentation by Dr. David Snediker may have been one of those “once in a lifetime opportunities”. Dr. Snediker whose expertise is in Tribology, the study of friction and lubrication, has worked on many projects for NASA. He said several spacecraft flying to distant planets currently were included in research programs he has worked on.

In 1977 Dr. Snediker and a team from Battelle began a project for Steinway & Sons, at the request of Theodore and Henry Steinway, due to complaints from various artists of uneven actions and noisy actions containing Teflon bushings. Some of the data is proprietary to Steinway and Dr. Snediker was unable to address all the research. His research began with a trip to the Steinway factory and remembers it as the best factory tour he ever took. Their approach included the properties of wood, and they decided to concentrate on the hammer shank center. The shank moved the most, and was under the highest load therefore, it was the most likely candidate where a problem would occur. Through accelerometer studies they found the hammer can accelerate from 0 to 120 mph in less than 2 inches. The team found this quite impressive. The work consisted of laboratory testing of the sugar maple shank and the virgin Teflon. They felt that the center pin variation was as good or better as one could reasonably expect for a commodity part. His team realized the distortion issue of anisotropy or that humidity fluctuation

was the initial problem. (as piano techs we kind of took this for granted) They found that when low humidity was present, the holes in the shank centers which housed the bushings would take an elliptical shape with a north/south orientation. If the humidity was high the elliptical shape favored a east/west orientation. This pinched the Teflon bushing out of shape. The result was a “loose” feel to the action accompanied by noise. The other problem was the Teflon bushing itself. Steinway chose “virgin” Teflon. This is Teflon which is pure and has no other material combined with it. As a result the virgin Teflon would actually change shape while at rest as well as when in motion during playing.

David’s recommendations to these problems were to select another type of Teflon. His opinion was to choose one with a composite of silica and clay added to the Teflon. This would make a very stable bushing allowing the Teflon to hold its shape. The other solution would be to insert a brass tube in the hammer center. This would allow for a consistent round hole despite the reaction of the wood to its surrounding and varying levels of humidity.

And finally he suggested to coat the center pin with Teflon. Time and money of course ran out before all levels of experimentation could be exhausted. Dr. Snediker felt friction, and heat build up may have also played a role in distortion of the centers. A urethane-Teflon system seemed to give similar performance to cloth. He also gave some interesting figures for breakaway torque Cloth -vs.- Teflon. This of course gendered a discussion on the value of the felt bushings. David agreed that the felt bushing was very adequate throughout many different humidity levels.

Meeting Minutes and Chapter News & Notes

Meeting Minutes (excerpts)

New Business:

Chapter elections were held and the current slate of officers retained their positions with the exception of Chapter Secretary, Kim Hoessly, who due to other commitments was not able to continue in that office. Mike Varrone was voted in unanimously to assume that position. The new officers are:

Pres. Mark Ritchie

Vice Pres. Chris Altenburg

Sec. Mike Varrone

Treas. Ron Kenreich

We were unable to direct the Chapter Delegate for the Council meeting as Chris was out of town. We did agree that the national dues rate increase may not be justified. Dean Nedvecki submitted his application form and check to become a member of the Piano Technicians Guild, and Mike Varrone renewed his membership. Both members were voted in for acceptance to the Guild by the Chapter members present.

The date for the **summer picnic** was selected as **August 27, 2005 at 4:00 pm** at the home of

Mark and Marilyn Ritchie. Several dates were discussed, and by majority this date seemed to work for most members present. As always, the Chapter will provide the meat dish and beverages, please bring a dish to share and call Marilyn to confirm attendance so we know how much to get. We'll get a reminder out in Aug.

Old Business:

We need to confirm that Rick Miller has renewed his membership and paid Chapter dues. Rick has completed his studies at Western Ontario.

Chapter News & Notes

Victor Wolfe got some publicity for the PTG by displaying his hand built telescope with the drive motor made from player piano parts. The event was held at Perkins Observatory and sponsored by the Ohio Arts Council. The program, "View from Dione" featured various artists and photo works relating to astronomy.



Victor Wolfe, and, right, our newest member Dean Nedvecki -welcome to the Columbus Chapter PTG.

Acrosonic Observations - 2nd in a series of articles from Thomas Harr

Servicing their Ideosyncracies

Pulling Actions.

Other than the unlamented Minipiano I can think of no model of spinet in which the removal of the action does not pose some degree of difficulty and aggravation. No exceptions in "The House of Baldwin" (as the grand plate medallions used to have it). At least these troubles can be greatly minimized with appropriate techniques. Of course the obvious one is: don't. There must be hundreds, at least, of technician's tricks for dealing with such services and repairs as

string replacement without ever removing, at least entirely (tipping does not count as removal), the action from the spinet at all. Seek these out and use them. Save lots of time (usually). Alas, the time comes when service or repair requires removal. Once all the screws have been removed from the action-bracket feet the biggest challenge presented by the W&B SIS action is its sheer weight. To deal with this (and the mass and awkwardness of any other drop-action) a lifting strap is suggested: a 2" nylon strap about four feet long with a snap or bolt-snap at each end can be draped around your neck and down the front of your shoulders and attached to the action brackets or hammer-rail by some suitable means (of your own devising for the occasion) so the action can be lifted with your back directly while being guided with your hands, instead of trying to raise and guide the action by strength of arms alone. The SIS action nicely takes care of the dangling drop-lifter problem. The problem with the genuine Acrosonic action is preventing the pins on the pick-up fingers from dropping out of the guide-rail once it has been detached from its brackets and especially after the action is out of the piano (Oops! The whole row of lifters flopped down and the rail just fell right off them.) The trick of using damper-block inserts is well known, but there are a couple of details worth pointing out. One is that aluminum inserts can be forced over the pins at the ends of each section because aluminum is soft and the wall section easily deformed. Not so with brass, it's too hard and the holes are too small. I don't know what size the pins are, but the set of four inserts I carry around strung on a wire loop are bored out with a #38 drill (0.1015"). In a pinch you can "borrow" some dampers for the purpose, providing they have aluminum inserts. Of course, as Gene Hechesky pointed out, if the mice have eaten the bridle straps its all for naught anyway. In any case, with the guide-rail tightly secured to the top of the wood section of the fingers, grasp the hammer-rail and push the guide-rail toward it with your thumbs, then lift the action out. You can see how a strap would assist here. As to the aluminum pick-up finger model, never having pulled one I can only offer suggestions. One possibility would be popping the fingers out of their guide and securing them to the hammer-rail with tape. Or perhaps it would be possible to remove the screws from the guide-rail and use it to contain the fingers a la the preceding action type. On the Howard action, once the wire drop-lifters and their grommets have been popped out of their key forks (carefully, old rubber is brittle, you could wind up with an unanticipated repair if they crack), what to do with them? String, tied between action brackets through the holes provided, to hold them up, has been offered as one solution. Also bungee cord with hooks. Or, there is the old newspaper trick. Drape double-page sections of newspaper with the fold on the back edge of the keys so that one page lies on top of the keys and the other hangs down over the keyforks between them and the detached drop-lifters. When the action is lifted the wires and grommets are kept from catching on the forks and will nicely lie down on top of the keys. Going back in you might want to hold the action upside-down to get the lifters in position first. This works with other similar spinet actions. Also with upright actions without bridle tapes when you don't want to bust the abstracts on the capstans. And, lastly the Baldwin "Full-blow" action borrowed, in addition to the grommet and keyfork arrangement, from the W&B SCD spinet action the sectional rod hook cast on the action bracket, except of course it's inverted. I've never decided whether this is a more or less convenient position, but it does require groping around under the keybed to get it in place to hold the drop-lifters. To get it past the brace install it in two pieces and screw them together behind the brace. And how many wondered what a sectional rod was, and what those protrusions on the action brackets signified?

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Published by the Columbus Chapter of the Piano Technicians Guild Mark Ritchie, Editor 6262 St. Rte. 605 Westerville, OH 43082

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