



GENERAL BRASSWIND INSPECTION

by Lars Kirmser

MOUTHPIECE

Although not usually a direct cause of radical instrument failure, the mouthpiece does require frequent attention. Mouthpiece hygiene is the distinct responsibility of the player, however, the repair technician is all too frequently required to perform the unpleasant task of cleaning the scum-like residue from the bore of the mouthpiece. Attention should be paid to the continuity of the mouthpiece plating as well as to the condition of its rim (e.g. is it peppered with small dents and scratches?). The shank must be perfectly tapered and absolutely round, so that it will fit perfectly into the corresponding mouthpiece receiver. It must also be exactly the right length, so that when the mouthpiece is inserted in place firmly, the end of the shank fits exactly up against the end of the lead pipe. This results in an undisturbed bore transition from the bore of the mouthpiece to the bore of the lead pipe. Without this perfect fit, the optimum performance of the instrument will be compromised.

LEADPIPE

Over time, and especially if it is not cleaned regularly, the leadpipe will start to be peppered with small pink spots between the mouthpiece receiver and upper slide receiver of the main tuning slide. This is more easily witnessed on lacquered instruments, than those that are plated. This problem is often referred to as "pink rot". This symptom indicates that advanced corrosion is working its way from the inside of the leadpipe to the outside. The small pink granules are the remaining concentrations of the metal copper (minus the zinc which was removed from the brass alloy, due to an over exposure to saliva). The only way to solve this problem is to replace the leadpipe. To witness the advanced corrosion, remove the main tuning slide and look through the leadpipe while aiming it at a light source. This is a good way to drive the point home to the player. It is fun to poke at them with a needle spring, but don't do this before you get permission to replace the leadpipe!

PISTON VALVES

The strength (resistance) of each piston valve spring should be only strong enough so that when engaging and releasing them, each valve will respond in a crisp, resilient manner. Naturally, there will be a range of preference among players, never the less, each valve must possess an identical response, and be free of any irregular or sluggish action. Nor should there be excessive noise when the valves are rapidly worked up and down.

There are many reasons why a valve will fail to respond satisfactorily, the most common being *dirty* valves. Remember, when a valve is in close adjustment, it will have only .001" to .002" between it and the wall of its casing. This doesn't leave much room for dirt or dents! Unfortunately, players have to be reminded frequently of the virtues of good preventive maintenance. Also, check to make sure that the valve stem is not misaligned, or that the valve casing has not been dented from an unsecured mouthpiece rattling around in the closed case; or a distorted casing, as when the crook of the #2 valve of the trumpet is compressed when forcing the case closed over music books. It is also possible that the valve itself has been damaged from accidentally dropping it on the floor.

To function properly, each valve must be in close vertical (up/down) alignment, as is facilitated by valve stem corks and/or felts of the correct thickness. The valve key guide must be such that there exists a minimum of rotational movement. A worn key guide will allow for too much valve rotation, and will cause the valve to become noisy and allow significant misalignment of the valve/casing portals. The valve's precision-polished surface must be without deep scratches, worn spots, pitting, exposed base metal, or other evidence of corrosion. Deep scratches on the surface of a valve piston indicates the presence of damaging foreign matter or burrs in the valve casing. Obviously, valve buttons as well as all valve caps (both uppers and lowers) must be

present and able to be easily unscrewed and screwed when it is necessary to remove a piston from its casing.

ROTOR VALVES

The inspection of the rotor valve involves many of the same considerations already mentioned in the preceding paragraph. There are, however, unique characteristics worth mentioning concerning the rotor system. The method by which a rotor valve is disassembled and reassembled is a bit more involved than is the case with the piston valve. It is important that the technician have some prior knowledge and understanding of the rotor mechanism before such a task is undertaken. Because the rotor valve is not usually plated, it is more vulnerable to various hazards than is the plated piston type.

Rotor mechanism will either be the mechanical style linkage (where a series of pivot arms actuate the rotors) or they will utilize the stringing method to transfer the rotational motion from the key to the rotor. In either case, the rotors must respond noiselessly and with resilience when the keys are depressed and released rapidly. Again, the key spring action must be only strong enough to facilitate this crisp action, no more, no less.

The rotational adjustment of the rotor is checked by removing the bottom rotor cap to make sure that the scribed mark on the bottom of the valve shaft lines up exactly with the adjacent marks scribed on the sleeve of the rotor bearing, as the key is fully depressed and fully released. It is important that there be an absence of "play" in the key action (often due to worn mechanical linkage, or stretched string, depending upon which system you are working with). As a final check of the rotor valves, the key levers must be adjusted to an angle that facilitates a comfortable hand position for the performer.

TUNING SLIDES

The tuning slides of a brasswind should be lubricated so that they may be easily moved or removed with gentle finger pressure. The frequency of lubrication will depend primarily upon the regularity of use, type of lubrication used, and the specific geographic area in which the instrument is played. My preference for slide lubrication is a product sold at Radio Shack called Teflon

Grease. Good preventive maintenance is absolutely necessary for a brasswind to enjoy a long-playing life. This is due, for the most part, to the radical internal exposure to the corrosive saliva that this family of instruments receives.

Slide tube alignment is critical to the ease with which the slide will go in and out of its corresponding receiver (outside slide). When each slide is pushed in completely (especially the main tuning slide) both slide tube ferrules must be perfectly aligned and touching their respective receiver tubes. If they aren't, the instrument has been knocked out of alignment. Check the solder connections of each slide by holding your thumb over one end and drawing a vacuum at the other end; if you are unable to hold a vacuum for several seconds, either one of the soldered ferrules has acquired a leak, or perhaps the water key assembly is leaking.

The internal surface of the each inner slide should be free of excess slide lubricant, residue, and corrosion. As a final check (if the slide is so equipped) examine the entire water key assemblies (spring adjustment, key hinge and screw, saddle, water key cork, water key nipple for deterioration of the solder, etc.).

TROMBONE SLIDES

Alignment is **very** critical to the trombone slide. Small deviations in slide alignment translates into large deviations, when spread over the length of a trombone slide. After alignment, cleanliness and lubrication play the next most important elements in the feel and response of a trombone slide. Aside from the fact that trombone inner slides are usually chromium or hard nickel plated, the criteria for checking this type of slide is identical to that of the smaller tuning slides discussed in the previous paragraphs.

The larger bearing surface of the plated inner slide (the bottom 5 or 6 inches) known as the *stocking* is slightly larger in diameter than the rest of the inner slide. It is at this stocking area where the plating will most likely to show wear. The brass or nickel outer slides of the trombone should be carefully examined for small "pin" dents or compressions (out-of-round). The tolerance between the bearing surface of the inner slide (O.D.) and the bearing surface of the outer slide (I.D.) is usually in the range

of about .010"; quite a bit greater than that of the piston to casing dimension given earlier. Never the less, even very small deviations will manifest into large problems with regard to trombone slide action.

Another problem unique to the trombone slide is the vulnerability of the end crook to damage. The health and continuity of this end crook is critical to the alignment of the lower portion of the long slide tubes. Be sure to examine the condition of the water key assembly.

BODY SECTION

With all the slides and valves (or rotors) have been removed, the technician is then able to carefully examine the bore of the instrument for cleanliness, absence of residue, and any signs of advanced corrosion. Occasionally, small objects may get lodged in the tubing of the instrument causing it to either play very much out of tune, or in other cases, to be totally inoperable. This seems to be a problem more often with the larger brasswinds (euphoniums, sousaphones, tubas).

Physically examine all of the braces for solder continuity and take special note of severe body dents that may affect the playing of the instrument. Soft soldered ferrules, slides, slide knobs, finger hooks and pull rings must also be checked. And, as a final step, examine the finish for possible surface etching (especially where the hands come into direct contact with the instrument).

CASE

The value of the instrument's case is many times underestimated as to its importance to the preventive maintenance of all instruments. Each case should be of solid construction and properly fitted to its instrument with secure blocking and padding. It should be equipped with sturdy, dependable latches, and be devoid of loose articles that are likely to cause damage to the instrument when being transported in its case.