

So, you're itching to modify your trumpet...but wait!

Many students in this college's band instrument repair program are educators or professionals who perform at advanced levels. With these high caliber students come inevitable questions about modifications (mouthpiece, leadpipe, adding/reducing mass, heat-treating, etc.). Before entering into discussions about acoustics and the impact of myriad modification options, we focus on a fundamental question that should be asked by all students, professionals, and repair technicians: *Is this trumpet playing as it was designed to play?*

Many trumpets can be markedly improved when a good repair technician focuses on ensuring the fundamentals of what the manufacturer/builder intended. Among the barriers to ideal trumpet performance, three are: Dimensional inaccuracies (unwanted bore changes, bumps and gaps), leaks, and stresses.

Dimensional Inaccuracies

Simply put, dimensional inaccuracies are unwanted variations impacting sound flow through your instrument. Not all irregularities are necessarily bad, but below is a partial list of inaccuracies that likely should not be there:

Dimensional Inaccuracies		<i>Impact</i>
<i>Area</i>	<i>What we correct</i>	
Instrument Interior	Scale, gunk, grime	With all of the these corrections, response, intonation, resistance pitch center, and "slotting" are impacted, each to varying degrees depending on the correction and its location.
Instrument Interior	Soft solder globs inside tubing	
Instrument Interior	Misaligned or gapped tubing at junction points	
Tubing	Closed/burred tube ends	
Casings/Pistons	Burrs inside casing knuckles/piston ports	
Casings/Pistons	Misaligned pistons to casings	
Waterkey	Burrs at the hole (remaining from drilling)	
Mouthpiece/leadpipe	Improper gap	
Mouthpiece receiver/leadpipe	Leadpipe not centered inside the mouthpiece receiver	
Leaks		
<i>Area</i>	<i>What we correct</i>	
Between the mouthpiece and its receiver*	Rough/inconsistent receiver interior	
Between outer and inner slide tubes	Looseness exceeding .001" ** (comparing diameters)	
Between valve casings and pistons	Looseness exceeding .0015" (comparing diameters)	

*leaks in the mouthpiece receiver are more common than most expect and the correction is not difficult. Often re-dressing the receiver taper or installing a new receiver with an error-free taper can make a dramatic improvement.

**One thousandth of an inch.

Dents

Rarely does a dent help a trumpet. Some we do not notice and some negatively impact instrument performance more than others, i.e. dents in the leadpipe generally cause more playing problems than dents in the bell stem, but a dent is an obstruction that is not supposed to be there.

Some argue that the metal hardening resulting from dents/dent removal creates performance issues greater than leaving the dents in. For severe dents, where the distorted shape and metal hardness impact performance many top repair techs heat treat the affected areas to restore the intended hardness of the manufacturer/builder. Others argue that removing a dent creates a dimensional anomaly equal to that of the dent, though a skilled technician would argue otherwise.

Stresses

Stresses can be introduced during manufacture (parts forced together when soldered and/or mis-aligned tuning slides forced to fit) or can be introduced by the player through the rigors of daily use. Typically, the more dents there are, the more stresses that have built up in the instrument. Often, removing and reinstalling a bell stress free or rebuilding tuning slides to proper alignment can do wonders for a trumpet that has lost its zing.

Do Your Part

Do not forget the simple things: Your trumpet needs to be well cared for. Keep your instrument clean. Typically, after three months of daily use, player-introduced gunk can close the bore by as much as .003” – in effect shrinking a medium-large bore trumpet down to a small bore. Keep your trumpet well lubricated, store it in a well-made hard case, and deal with dents and bends as soon as possible.

The trumpet is a tool for expression and for making a living. We all want to play our very best. That means our trumpets should be their very best. Before jumping on the modification bandwagon, consult with a repair technician that understands the subtleties of what you are after. A good technician knows what to look for when problems arise and knows what to do when, as you advance, your trumpet may not be delivering what you expect of it. Many simple adjustments/corrections can address issues before major modifications are called for.

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