

## Pipe and Punty maintenance guide

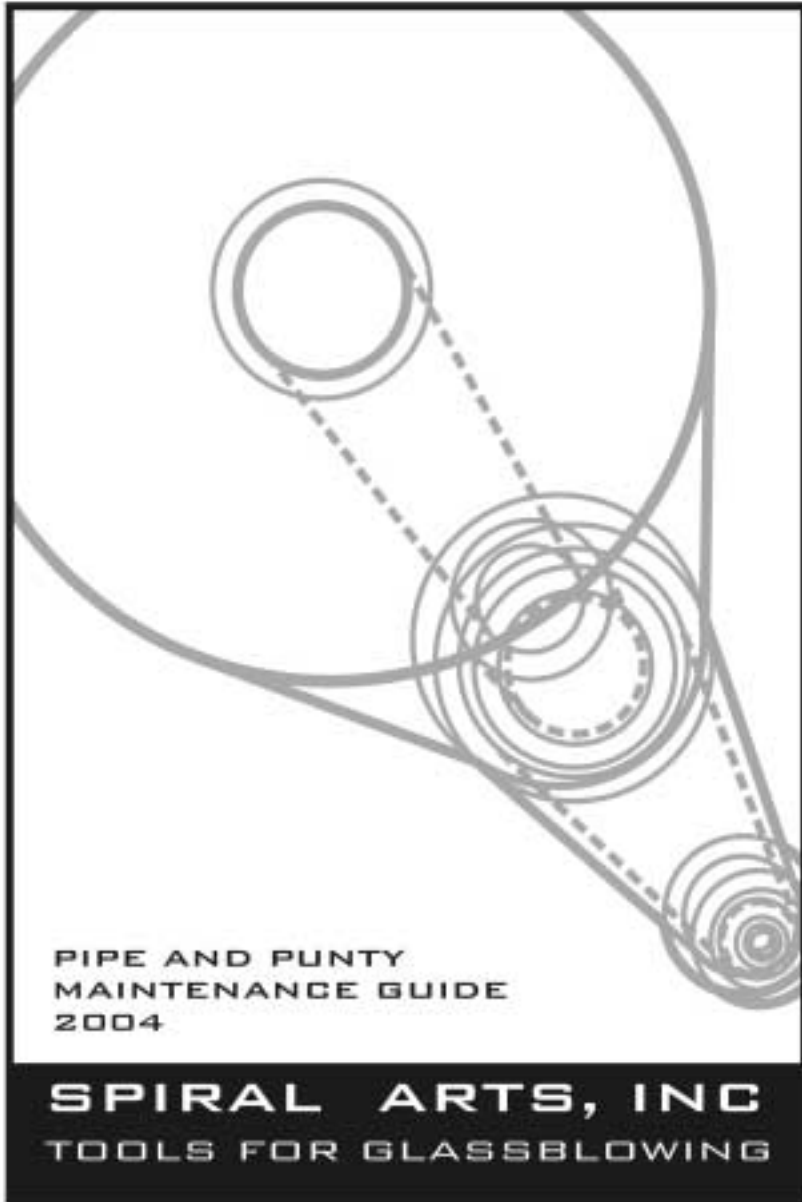
### Stainless steel VS carbon steel – Start by choosing the right pipe for you

Spiral Arts builds all stainless steel pipes and punties as well as carbon steel bodied pipes and punties and a few all carbon steel punties. Many glass blowers like the feeling of steel bodies, although there are pro's and con's to both metals. If you have never blown with steel pipe beware – they will develop scale much more quickly than stainless pipes when the tip of your pipe is more than 3" inside the glory hole. They will also develop serious interior rust problems in pipe warmers where they are in direct contact with the flame. Pipes made of carbon steel may develop scale within weeks if the neck (the area between the head and the body of the pipe) is ever allowed to glow red. The larger the pipe the more likely you are to have serious scale problems.

	Stainless steel	Carbon steel
More likely to bend	√	
Develops scale more quickly		√
Available in more sizes		√
Slippery surface	√	
Body will rust		√
Better for beginners	√	
Better for production glass blowing	√	
Better for cup work		√

### What is scale and where does it come from?

When the iron in the body of a steel pipe exceeds 1,200°F it will begin to oxidize – literally to burn – and the result is a thin layer of scale. This scale is brittle and easily detached from the steel layer below. When the scale gets loose, it will eventually find it's way down the head of the pipe and into the glass. Scale tends to develop in 2 areas in the pipe, in the neck near the weld and in the head about 1" from the tip of the pipe. The scale in the neck can often be jarred loose and worked around. Scale in the head of the pipe is extremely difficult to get rid of and usually is a sign that the head needs to be replaced



## How to avoid scale (also how scale can get out of a pipe you think is clean)

*Avoid overheating* – if the weld between the head and the body of the pipe ever gets red hot, scale is forming inside the pipe. This problem is much worse in steel bodied pipes but scale can still form in all stainless steel bodies. If you can avoid reaching into the glory hole deeper than the weld, your pipes will be much less likely to scale.

*Avoid quenching your pipe after your finished with your piece* –If you leave a hot pipe in water the head steams and creates dampness inside the pipe. This of course will lead to rust in steel pipes. If you have scale in your pipe (steel or stainless) and water has condensed inside, when you go to reheat the water turning to steam may cause any scale that has built up to loosen and be available to fall into your glass. You should also avoid deep quenching. If you have scale in your pipe quenching around the weld between the head and the body will loosen any built up scale. Avoid using a “bubbler” – an air hose attached to the pipe while your pipe head is submerged in water. Bubblers greatly reduce the life of the pipe’s head.

*Use of the pipe cooler* – If you quench your pipe near the weld between the head and the body, the thermal shock to the pipe can loosen scale inside the pipe and what seemed to be a scale free pipe will suddenly spit scale into your glass as soon as the pipe swings down.

*Use of the pipe warmer* – If your pipe warmer’s flame comes into direct contact with the head of the pipe, it can cause water to condense inside the pipe, which may cause scale to pop off when you gather. You may also discover the body of the pipe is unusually hot after it has been on the pipe warmer for an hour or more.

## Cleaning out scale in a pipe

If you have a pipe that has been spitting scale there are a few things you can do to remedy the situation. First it is helpful to know how to avoid having a seemingly clean pipe spit scale – see the section above, and then use the following techniques to loosen and flush loose scale from your pipes.

*Pinging method* – you will need a small piece of steel round, ½”x10”long works well, and a piece of white paper. Set the piece of paper on a table and in one hand hold your pipe and with the other, using the steel round, tap the area between the head weld and 3” above all the way around the pipe. You should make about 100 blows. Doing this over the clean sheet of paper allows you to see the scale falling out. Once your “pinging” can release no more scale your pipe is as clean as this method will allow.

*Stiff wire* – you will need to acquire a piece of stiff round “piano wire” about 3/32” in diameter. This type of wire is often available at hobby stores or hardware stores in the section that sells little pieces of angle iron or balsa wood. The wire is a hardened alloy steel and is usually so hard that it will ruin side-cutting pliers if you try to cut it. You will need a section of wire about 9” long. Using pliers, bend the end of the wire in a gentle arc, this wire can now be put into the end of a power drill, inserted in the end of the pipe (without the drill running) and then use the drill to ream out the inside of the head – this method works well in older pipes with forged mouthpieces and for pipes with scale inside the head. It doesn’t get much of the scale near the weld between the head and the body.

*Send it back* – If you send your pipe back to Spiral Arts for repair we will cut the head off, ream out the body and make sure it is rust and scale free, inspect the head and either replace it or if it is scale free weld it back. Usually a repair is no more than ½ the cost of the pipe new.

## Cleaning the surface of your pipes and punties

*Steel* – the primary issue with steel pipe is rust on the surface. The best way to clean the surface of a rusty pipe is with steel wool or Scotch-Brite. If you want to keep the rust from coming back right away, rubbing it with a little bees wax can help to seal the surface and slow down the rust.

*Stainless steel* – The primary problem with stainless is that it gets polished and slippery. To fix this use a piece of 180 grit wet/dry sand paper and rub the surface of the pipe vertically.

## How to break in a new pipe

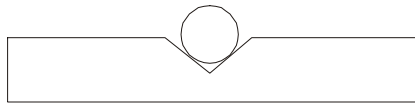
When you first receive a new pipe you will want to check for dust and defects and take a few initial gathers on it in before using it normally. If you have an air gun, it is a good idea to blow air through the pipe to blow out any dust that may have settled inside during shipping or packing. Check the pipe for straightness and any surface defects. Initially the raw steel surface will not gather glass, as it heats up glass will begin to stick and allow you to take a gather. Discard the first 2 gathers, returning the pipe to the pipe warmer each time as if you had finished a piece with it. After the second gather you should be ready to use it normally.

## Guide for straightening your pipes and punties

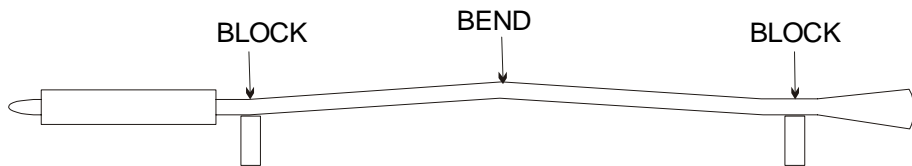
### Bent body



Step 1. Put pipe on 2 supports – preferably wood blocks or if your in a hurry, your bench rails.



Ideal shape for woden block

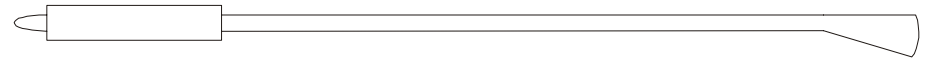


Step 2. Sight down end of pipe while turning, and position your pipe so the high side of the bend is up. Mark the high side with chalk or a “sharpie” marker. Note: you can also use a dial indicator to find the high side of the pipe.

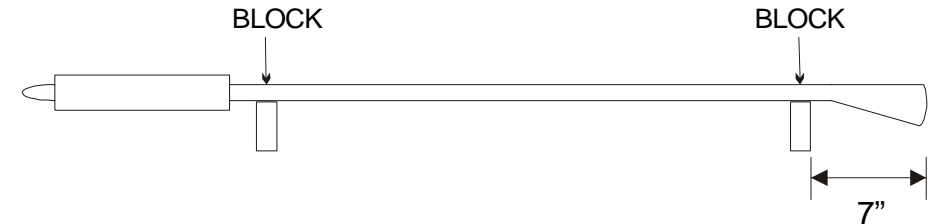
Step 3. Beginning with light pressure, push down with both hands and check for straightness to see how much the bend has changed.

Step 4. Check head for straightness and repeat if necessary.

### Bent head



Step 1. Put pipe on 2 supports – preferably wood blocks same as for straightening bodies. The block near the head should be located just behind the weld between the head and the body. Measure 7” back for all pipes up to PI-BBP.  $PI-BBP=8''$



Step 2. Rotate pipe and observe high spot on head. Locate high spot up and mark it with chalk or a “sharpie” marker.

Step 3. Using a soft head hammer or mallet (we use a small dead blow hammer), hit the end of the head with a light blow. Rotate the pipe and again observe the position of the high side. If the head has not moved increase the power of your hammer blow.

**Hints:** we use a dial indicator to show us how bent a head or body is. The dial indicator is accurate to within .001” although we straighten all our heads and bodies to within .003” off center. Beware of “S” bends where there is actually 2 bends in the pipe in different directions. If you have an “S” bend position your blocks closer together and focus on straightening only one bend at a time. Never use a hammer to straighten the pipe body and never slam the pipe on your bench rail to straighten a head. Stainless is much easier to bend than steel – be careful of being too aggressive with stainless bodied pipes or puntys.



Dial indicator being used to straighten a head

## **Storage**

Steel pipes should be stored upright in a dry warm area – often behind or near hot equipment if space and safety allow. Steel pipes will normally develop rust after being stored for long periods of time or if you are in a damp climate. Be prepared to clean steel pipes stored for more than a week.

## **Shipping**

If possible shipping in thick-walled cardboard tubes is usually the best cheap method since tubes will take more abuse than cardboard boxes if you send them via UPS or Fed-Ex. If you can afford it, wooden crating is the best method for shipping pipes. Your tools should be packed tightly. Make absolutely sure your pipes cannot move around in your shipping container. Make sure the end caps are secured extremely well using several wraps of nylon strapping tape. Do not use duct tape to secure shipping containers. Avoid PVC tubes, they are very brittle and likely to crack when shipped.

For additional information and repair estimates:

*Spiral Arts, inc.*

2940 Westlake Avenue North

Suite 100

Seattle, WA 98109

206-768-9765

888-369-5616