# How a Blind Rivet Setting Tool Functions 鉚釘槍的運作機制

*by Anthony Di Maio*

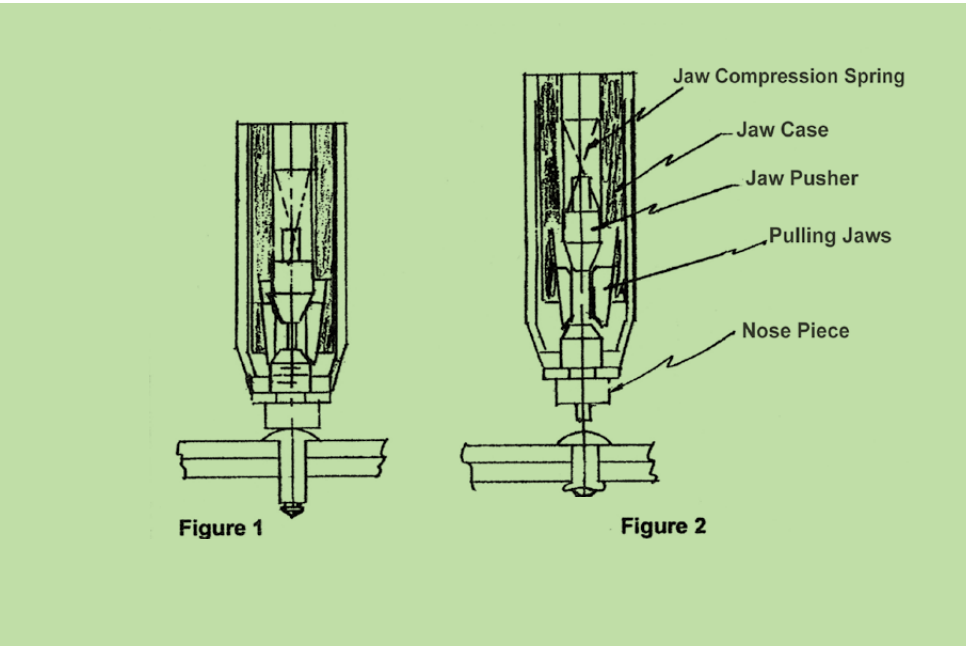
To maintain proper setting of blind rivets, your blind rivet setting tool must be in good working order. A power setting tool, whether manual, pneumatic, pneumatic hydraulic or electric, should set a blind rivet within the grip range of that blind rivet, in one stroke. If your setting tool does not set the blind rivet in one stroke, then your setting tool is not functioning correctly.

The pneumatic hydraulic setting tool is the most popular. The pneumatic hydraulic setting tool functions in the following manner:

Compressed air is injected at the bottom of the tool and pushes the air piston up. The rod of the air piston is pushed into the hydraulic oil chamber. As the air piston rod enters the hydraulic oil chamber, the rod displaces its volume equal to hydraulic oil into the hydraulic piston, thus pulling the pulling jaw (**Figures 1 & 2**) assembly, setting the blind rivet. As the hydraulic piston moves back, it compresses the compression spring.

When the compressed air piston completes its forward stroke, the blind rivet is set and the operator releases the setting tool trigger and the compression spring pushes the hydraulic piston fully forward, opening the pulling jaws to release the spent mandrel and also pushing the hydraulic oil back into the hydraulic oil chamber that pushes the compressed air piston down exhausting the compressed air. The setting tool is now ready to accept the next blind rivet.

All blind rivet setting tools use pulling jaws to pull the mandrel to set a blind rivet. Some setting tools use two-piece jaws and others use three-piece jaws, but in either case the theory is the same. The jaws are housed in a jaws case along with a jaw pusher and a compressed spring.



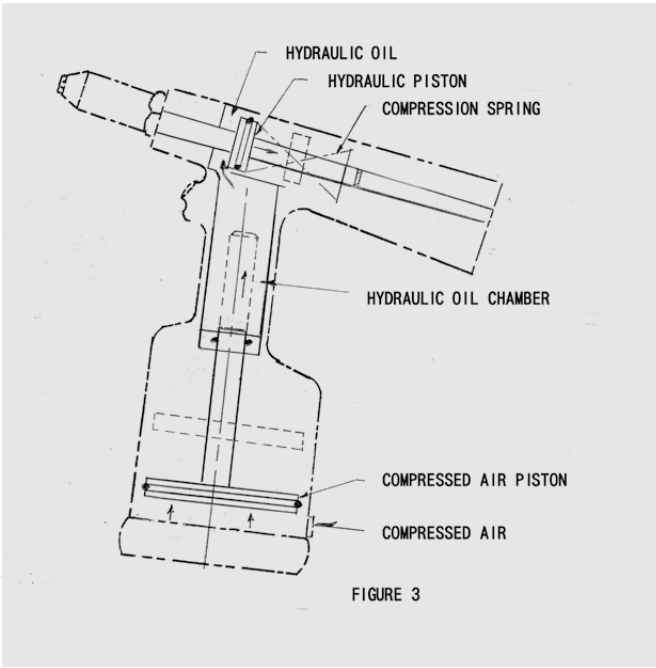




**Figure 1** illustrates a setting tool ready to receive the mandrel of a blind rivet. Notice how the jaws open in a parallel axis. This opening action is achieved by the jaws (two or three piece) being forced against the nosepiece as the jaw case is being powered towards the nosepiece. As the jaws contact the nosepiece, the jaw case continues to move, forcing the jaws against the jaw pusher and the compression spring. The jaws are against the nosepiece at one end and the spring loaded jaw pusher at the other end compressing on them. This separates the jaws in a parallel plain enough to accept a blind rivet.

The travel distance of the jaw case is constant. It can only travel the forward stroke distance of the power tool. Therefore, to open the jaws to accept the mandrel of a 1/4 inch blind rivet, the 1/4 inch nosepiece has to have a longer threaded section than the nosepiece for the mandrel of a 1/8 blind rivet. So when you are changing nosepieces for blind rivets of different diameters, you are also changing the amount the pulling jaws open.

When the setting tool starts its blind rivet setting stroke, the jaws leave the nosepiece and the jaws are pushed onto the diameter of the mandrel and grip the mandrel. If the teeth of the pulling jaws are filled with flakes of plating, chips of aluminum, steel, etc., from blind rivets set previously, the teeth of the jaws cannot grip the surface of the mandrel to set the blind rivet. This is when the pulling jaws will slip along the mandrel before gripping the mandrel and setting the blind rivet. Disassemble the tool according to the manufacturer's instruction manual. Clean the teeth of the jaws with a hand wire brush, oil the outer surfaces of the jaws and re-assemble the tool. If the jaws are still slipping, replace them with a new set.

Check to see that your power tool is stroking the full distance as stated by the manufacturer. If you are using a pneumatic hydraulic tool and the tool is not stroking the full distance, you have most likely lost some oil from the hydraulic section.

Always follow the manufacturer's instruction book regarding the maintenance of the blind rivet setting tool and you will always set blind rivets in one stroke.

All setting tools have a nosepiece for each diameter blind rivet, because each diameter blind rivet has a different diameter mandrel. We know now, the larger the mandrel diameter, the longer the threaded section of the nosepiece. If you were to use a 3/16 diameter nosepiece as the jaws opened for the 3/16 blind rivet mandrel, the jaws have a larger distance to travel to grip a diameter of a 1/8 diameter blind rivet. You will also see a circular indentation on the flange of the 1/8 rivet because the hole in the 3/16 nosepiece is larger than a 1/8 nosepiece and the larger hole of the 3/16 nosepiece pressing against the 1/8 diameter blind rivet will leave a ring mark on the flange.