

TECHNICAL BULLETIN No. 10

TROUBLESHOOTING MAZZEI® INJECTORS

When properly specified, installed, and operated, Mazzei® Injectors provide trouble-free operation. In the real world, however, there are a number of factors that can cause a Mazzei® Injector to decrease in performance or fail to perform altogether. These factors are discussed in detail below.

A. Installation Tips

1. Mazzei Injectors should be installed with the flow arrow in a horizontal or upward position. If installed in a vertically down position, there must be at least 5 to 10 psig of outlet pressure.
2. To optimize performance of a Mazzei Injector, there should always be some piping attached to the injector outlet. As little as 12" of piping works well when venting directly to atmospheric pressure.
3. Always use "full flow" valves and fittings when connecting to a Mazzei Injector. Never use piping or pipe fittings smaller than the thread size of the Mazzei Injector.
4. Do not over-tighten Mazzei Injectors when attaching them to pipe or fittings. The use of a thread sealant is recommended.
5. Mazzei® Injectors require a pressure differential to operate properly. Normally, the outlet pressure must be at least 25-30% less than the inlet pressure for significant suction to occur. Pressure gauges are very helpful in establishing the actual pressure differential.

B. Some Simple Tests To Determine Whether or Not a Mazzei Injector is Working

1. With the suction line disconnected and the injector in operation, place your finger over the suction port. Can you feel suction?
2. With the suction line disconnected and the injector in operation, gently depress the ball inside the internal check valve on the suction port. A slender, blunt tool should be used for this purpose. Does water spurt out of the suction port?

If you can feel suction, and water does not spurt out the suction port during operation, the injector is generating a vacuum and is working properly. If you cannot feel suction, and water does spurt out the suction port during operation, the injector is not generating a vacuum.

C. Reasons Why A Mazzei Injector Might Not Be Working

1. **Injector is Damaged:** Mazzei Injectors are made from either Polypropylene or PVDF thermoplastics. Both of these materials are quite resistant to abuse. They can be damaged, however, by over tightening, from impact, or from being subjected to excessive torsion. If you suspect this to be the case, examine the injector for cracks, holes or other signs of damage. If any are found, replace the injector.
2. **Insufficient Pressure Differential:** Mazzei Injectors typically begin suction with a water pressure differential of about 20%. Significant suction does not begin until the water pressure differential is in the range of 25-30%. For liquid suction, Mazzei Injectors reach maximum suction when the water pressure differential is about 50%. For gas suction, suction capacity increases until the outlet water pressure is zero. It is difficult to estimate

water pressure differential. It should be measured with pressure gauges both upstream and downstream of the injector. An important characteristic of Mazzei Injectors is that they do not, by themselves, create a pressure differential. Both the upstream and downstream pressures experienced by an injector are caused by the system into which the injector is placed, not by the injector. Thus, merely placing a Mazzei Injector in a pressurized water line will not necessarily create any water pressure differential, other than friction loss. If a particular system cannot generate sufficient water pressure differential for the Mazzei Injector to operate properly, then an alternative method of installation must be considered.