

Valve Failure

1. Beer Leakers

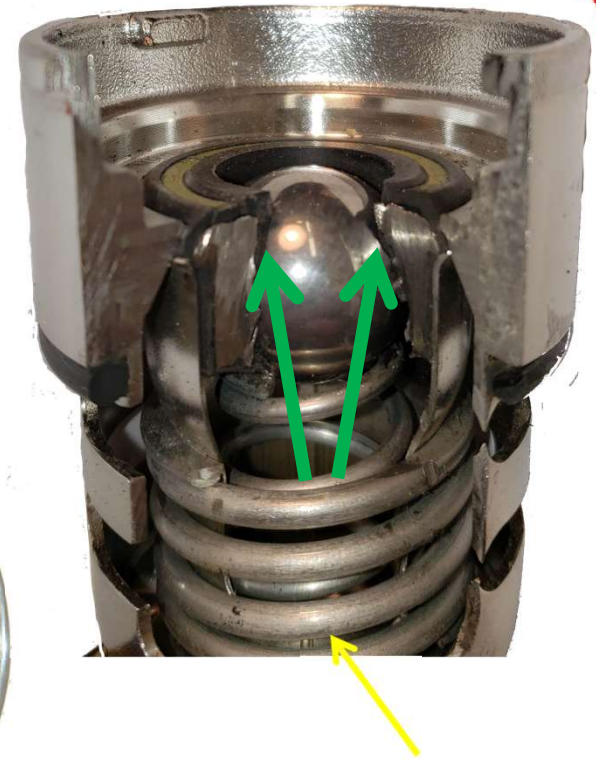
Symptoms - Beer leaks from the interface between the beer valve (ball or poppet) and the CO₂ Valve, usually due to damage to either valve in the form of cuts, gouges, or dry rot.

In-market causes are most often related to damaged or carelessly used keg couplers. Couplers with burrs or sharp edges on the beer probe can cause damage to both beer and CO₂ Valves. Damage is even worse when couplers are carelessly engaged.

In-brewery causes include damaged couplers, poorly designed or maintained keg wash/fill equipment which may impact, cut, or gouge valve parts, and overfilled kegs with little or no headspace.

Remedies typically involve disassembly of the spear and replacement of the damaged components, requiring special tools and training, or simply replacing the entire spear as a unit.

Prevention – Good design and maintenance of draft packaging and dispense equipment and observance of proper fill levels



Valve Failure

2. CO₂ Leakers

Symptoms - Gas leaks around the gas sealing surface at the outer diameter of the CO₂ valve. (fig 1)

Causes – The most common are foreign objects stuck in the interface between the CO₂ valve and the spear body (fig 2). These objects include dry hops, splinters & char from barrels, and scrubby pad threads & brush bristles from manual cleaning of the keg well. Sometimes overfilling, over-pressurization, or improper maintenance techniques can cause damage to the CO₂ valve resulting in gas leaks also (fig 3).

Remedies - Can often be as simple as flushing the foreign material out of the sealing area by sending the keg through the washer for an extra cycle or two.

Stubbornly lodged objects or damage to the CO₂ valve may require disassembly of the spear or replacement of the CO₂ valve.

In rare cases of damage to the valve body itself, it may be necessary to replace the entire spear.

Prevention - Practice proper filling and cleaning techniques, and make efforts to exclude foreign material from beer entering the kegs.

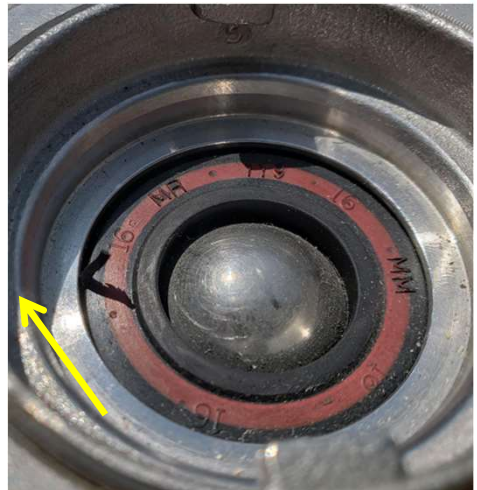


Figure 2

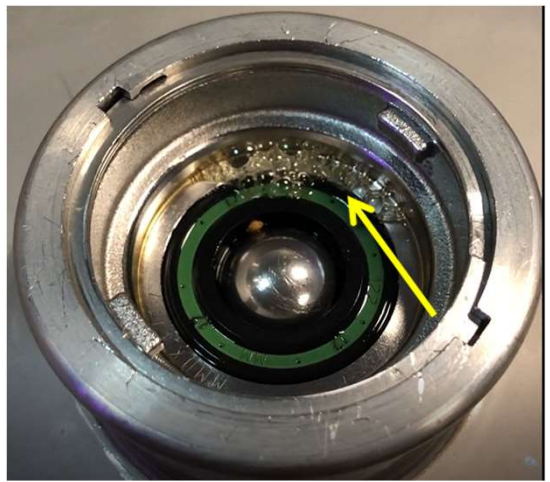


Figure 1



Figure 3

Valve Failure

3. Foamer Kegs

Symptoms - Beer foams at dispense without any identifiable cause associated with the dispense system. The raised rim around the inside diameter of the CO₂ valve is damaged, allowing gas to pass from the gas passage over into the beer stream.

Causes - Similar to those for beer leakers. Kegs that have been stored with extended exposure to the sun are also prone to this type of failure due to cracking and dry rot. These problems will only be identified by observing valve damage during visual inspection at the brewery or by poor pouring performance in the market.

Remedies - Replacement of damaged CO₂ valves

Prevention is the critical issue here, involving proper identification of the problem before the keg leaves the brewery. This can only be accomplished by good training for keg technicians to identify any damage and pull kegs out of service before they can return to market.



Cracked rubber from UV exposure (sunlight)



Impact damage to raised rim on CO₂ Valve



Valve Failure

4. Neck Leaks

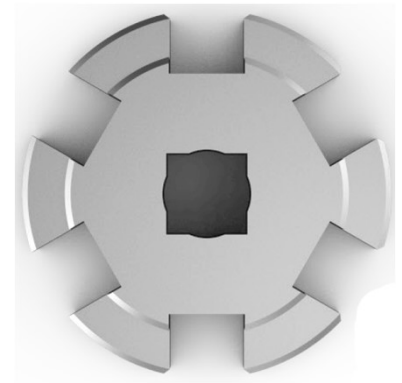
Symptoms - Beer or CO₂ seeping out at the top of the neck. This is a fairly rare occurrence in drop-in spears. It is much more common in threaded spears.

Causes - The O-ring (drop-in spears) or sealing ring (threaded spears), which seals the spear into the keg neck is degraded, damaged, or spear is loose.

Drop-in spears - Over-compression of the O-ring during installation or failure to wet the O-ring prior to installation, which results in damage to the seal.

Threaded spears - Leaks can occur as a result of insufficient application of torque during installation (~55 ft/lbs), failure to wet the sealing ring prior to installation, failure to periodically re-torque the spears (~35 ft/lbs), and loosening of the threaded connection caused by tampering or attempts to remove couplers which have become stuck in the spear.

Prevention - Wetting of all O-rings and sealing rings prior to installation, tightening and retightening threaded spears to specified torque settings.



Torque Wrench Adapter for Threaded Spears



Valve Failure

5. Delamination of the CO₂ Valve

Symptoms - Rubber deteriorates and cracks, separating from the metal core inside of the valve, resulting in areas which may be uncleanable and harbor contaminants. Early symptoms can be difficult to identify but operators should look for flaps of rubber (fig. 1), or bubbled/swollen rubber (fig. 3). Valves with advanced delamination (fig.2) will often fail to drain when inverted and placed on the keg washer

Causes - This is most often found on very old valves (10+ years), valves that have been subjected to excessive steam or chemicals during cleaning and sanitation, or stored in exposure to UV (sunlight). This failure can often be identified by a failure of kegs to drain properly on the keg washer. Visual signs of delamination are shown, but may not be evident until well after these have become a QA/QC risk.

Remedies - Replacement of the CO₂ valve is required once this damage has occurred.

Prevention - The best way to avoid this damage is a preventative maintenance program, which ensures valves are replaced in a timely fashion, prior to delamination due to old age. It is also important to frequently check the temperatures and concentrations of steam and chemicals in your keg line to ensure they are not causing premature wear to the CO₂ valves, and to protect valves from prolonged exposure to sunlight.

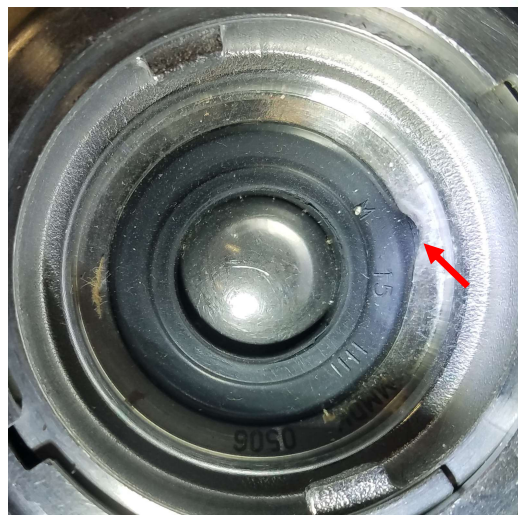


Figure 1



Figure 2



Figure 3



Valve Failure

6. “Seeper” Kegs

Weakened springs in the valves cause the beer valve (ball or poppet) to seat poorly or bounce when the kegs are moved. These kegs will leak/seep/“burp” small amounts of beer into the well unpredictably.

Causes - Springs are weakened prematurely due to over-stroking (over-compression) caused by poorly designed wash probes, through normal wear-and-tear, or due to spears being rebuilt using worn springs.

Remedies - Replace damaged or worn springs

Prevention - Make sure that your keg washer is equipped with wash probes designed to stroke the beer and CO2 valves the correct distances and that the machine is properly adjusted for stroke.

Rebuild spears as part of a preventive maintenance program which includes replacement of worn or damaged springs. A partial rebuild may lead to difficult to track nuisance seepage.

