HOW TO:

Repair irrigation system breaks

By Larry Workman, LASCO Fittings Inc.

Larry Workman

A gasket repair coupling is one way to repair an irrigation leak.

Don't just find the source of the leak; find out what is causing the leak.

It always seems to happen the first thing in the morning—a leak in your irrigation system that needs to be fixed immediately. What's the best way to repair the problem and get your irrigation system operating again?

Because most irrigation components, fittings and connections are below grade, you may not be able to immediately determine the location of the leak. If you have a stream of water shooting into the air, the leak is easy to pinpoint. However, if the leak is underground, you may have to do a little "digging" to help you locate the source.

Once you find the source, you must identify the failed component. It is amazing how many times customers send a "leaking fitting" to a manufacturer only to have the company discover in the laboratory that the actual leak was in another component or at a distance from the assumed leak.

For field repairs, to eliminate the problem, you must repair the actual leak. The more dirt, mud and water you can clear away from the leak, the

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easier it is to discover the true leak point.

From the outside in

After you identify the leak, you must establish the repair method. Any failure that is the result of external stress or loads will recur if you do not remove that stress. If you need to install additional supports or restraints to remove the external stress, make sure you do it before making repairs.

With external failures, a crack or break will progress from the outside of the pipe or fitting toward the interior. A simple method will help you determine if a failure is external. Try bending the component to open the crack or make it wider. This will reveal the directions the external loads were applied.

The surest method for repairing a failed component, fitting or pipe is to replace it. There are many kits, methods and so-called solutions that involve patching a leaking system, but remember that all materials, including PVC, fail after being exposed to excessive loads, high pressures or poor installation. An external patch will not address the cause of the failure.

Pipe and fittings are manufactured from molten plastic, either by extruding or injection molding. Few repair methods can produce a patch or repair that becomes as homogeneous with the fitting as the molding process. The patch or repair should therefore be considered only as a temporary solution.

BENDING PIPE TO INSTALL A SOLVENT JOINT	
To repair a pipe of this diameter...	...expose this many inches of pipe on each side of the joint.
½	30
¾	30
1	36
1 ¼	36
1 ½	40

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Using a gasket repair coupling lets you install replacement fittings and pipe without deflecting the lines.

From the inside out

Internal or hydraulic failures emanate from the interior of a fitting or pipe. Placing a patch on the outside does not remove, heal, cure or fuse the origination of the failure, and it will be only a matter of time until the failure recurs. Systems that leak due to excessive internal pressures, especially if they are of a cyclic nature, have "bruised" all the components. The replacement of the failed component will strengthen the weakest link in the chain, but the next weakest or bruised component may give way soon after.

Again, it is important to understand that a failure is the result of something going bad, and you must correct the problem before it will disappear. More than 90 percent of the "failed-after-installation" parts that customers return to manufacturers failed because of poor installation or system design, mistreatment or inappropriate system operation.

The fix

OK. Now that you have located the leak and determined the cause, how do you repair it? Your toolbox should include a miter box or pipe cutter for square cuts, PVC primer and cement for solvent-cemented joints, and a non-hardening thread sealant for threaded joints. Use a knife or file for removing burrs and rough edges of any cut pipe.

If the leak is within a fitting or section pipe, you must remove that area. If the pipe is cracked, make sure to remove enough pipe on both sides of the crack to obtain an undamaged pipe wall. Using a gasket repair coupling, a telescoping fitting or a section of pipe with new fittings to replace the damaged area are the better approaches.

If you are going to repair the leak by bending the pipe in order to make the solvent joint, you must expose enough pipe on each side of the connection to allow deflection of the pipes and insertion into the socket. The table above shows how much pipe to clearly expose for the pipe and fittings to be assembled. This method is easy for smaller-diameter piping systems. However, as the diameter increases, the chore becomes more difficult. Experience has shown that you

should limit use of this method to sizes less than 1.5 inches.

Telescoping repair-type fittings compensate for small amounts of missing pipe, typically equivalent to the depth of a standard "socket." These items are ideal for the larger-diameter piping systems that you cannot repair by deflecting or bending.

A gasket repair coupling has the advantage of sliding along the pipe length. This allows clearance for installation of the replacement fittings and pipe without deflecting the lines.

After you position all the components, tighten the compression nuts to create a seal on the pipe wall. Because the seal of the compression fitting does not bond the components, you may need either thrust blocks or restraints to prevent "blow off."

Watch out for mud

Just as you glue joints in a new piping system, you must follow the same procedure for a leak-free repaired system. However, you will encounter additional complications when making repairs—mud and water.

The dirtier the work area and components, the more likely the chances for failure. Use buckets, scoops or trenches to drain the excess water and mud away from the joining areas. Use rags to wipe and clean the areas to be solvent cemented. The earlier in the repair process that you can clean the area and allow it to dry, the better. Think of it from the viewpoint of a surgeon: They will clean, shave and swab a large area around an incision to keep contamination down. Look at mud and dirt as contamination to glued joints.

Because a compression fitting does not bond with pipe components, you may need thrust blocks or restraints to prevent "blow off."

Step by step

Using the standard procedure for solvent cementing pipe and fittings, start by making cuts that are "square" to the pipe.

① Clean all burrs and rough edges from the end of the pipe. It is not necessary to chamfer the end of the pipe; just remove the rough edges.

② Dry-fit all components to assure a proper fit, alignment and placement.

③ Using an applicator at least half the diameter of the pipe, apply primer to both the pipe and the fitting socket.

④ Immediately, again with an applicator that is half the diameter of the pipe, apply a coating of cement to the pipe end.

⑤ Apply a light coat of cement to the fitting socket.

⑥ Add a second coating to the pipe.

⑦ Assemble both parts with a twist-

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Grounds Maintenance

Dirty and wet work areas increase the likelihood that the repair will fail.

ing motion.

⑧ Allow sufficient time for the joint to cure. The minimum time you should allow before pressurizing the joint is 1.5 hours.

⑨ Pressure test the system for leaks.

⑩ Backfill and cover the repair area.

Remember: When repairing an irrigation system, your first and more important step should be to find the cause of the failure—not just where the leak is coming from, but what caused the problem. Just fixing the leak may not prevent another in the future. Make the necessary corrections to the irrigation system to prevent the problem from recurring.

Be aware that if the break or leak was due to water hammer, surges or other extreme pressures, the total system, including all fittings, may have been "bruised." Just replacing the leaking or broken fitting would be like replacing the weak link in a chain. The next weakest link will become the next likely location for failure. **GM**

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