

3-1-1969

# Prevent Water System Failures

Paul E. Johnson

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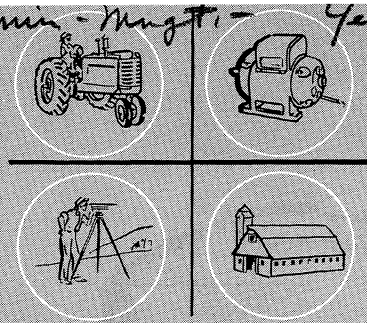
Johnson, Paul E., "Prevent Water System Failures" (1969). *Historical Documents of the Purdue Cooperative Extension Service*. Paper 49.  
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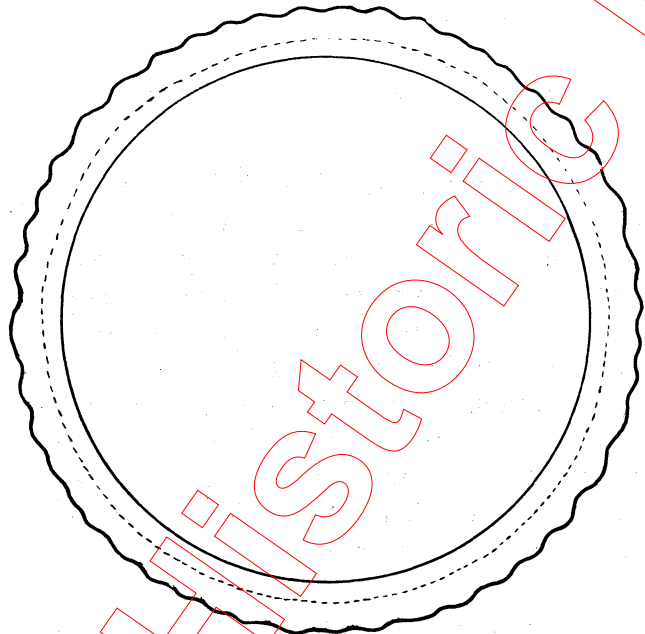
AE-74  
March 1969

## Prevent Water System Failures

*Paul E. Johnson, Extension Agricultural Engineer*

There are many different types of domestic water pumps on the market today. The correct pump should be selected with care so it will perform properly under your particular situation. The two most common problems with a domestic water system are water logging and iron in the water. Some dealers say 90 per cent of their service calls are for water-logged systems. Water

is not compressible. It is therefore necessary to have a cushion of air in the pressure tank. For 50 years some method of replenishing this air supply has been incorporated with the pump system. Air mixed with water will cause a corrosive action and, eventually these air devices fail. The system is then water-logged. The pump will start and stop frequently. This causes burning of the points of the pressure switch and later motor damage. Another method, commonly used, has been to pump in an excess amount of air and bleed the un-needed air out of the tank. This adds two devices to cause trouble.



The most trouble-free method of installing any domestic system with vertical pressure tank is to eliminate all air pumps, air volume controls, or any system of admitting or releasing air automatically in the system and to install an air seal in the pressure tank (see figures 1, 2 and 3) <sup>1/</sup> There are several types of seals on the market that can be installed through a 1-1/4-inch diameter

<sup>1/</sup> A small plastic funnel comes with the seal which should be inserted in the 1 1/4-inch opening before inserting the seal. This will prevent damage to the seal by the rough edge of the opening.

Figure 1. This is an air seal expanded. It must be purchased in the correct size to fix a pressure tank.



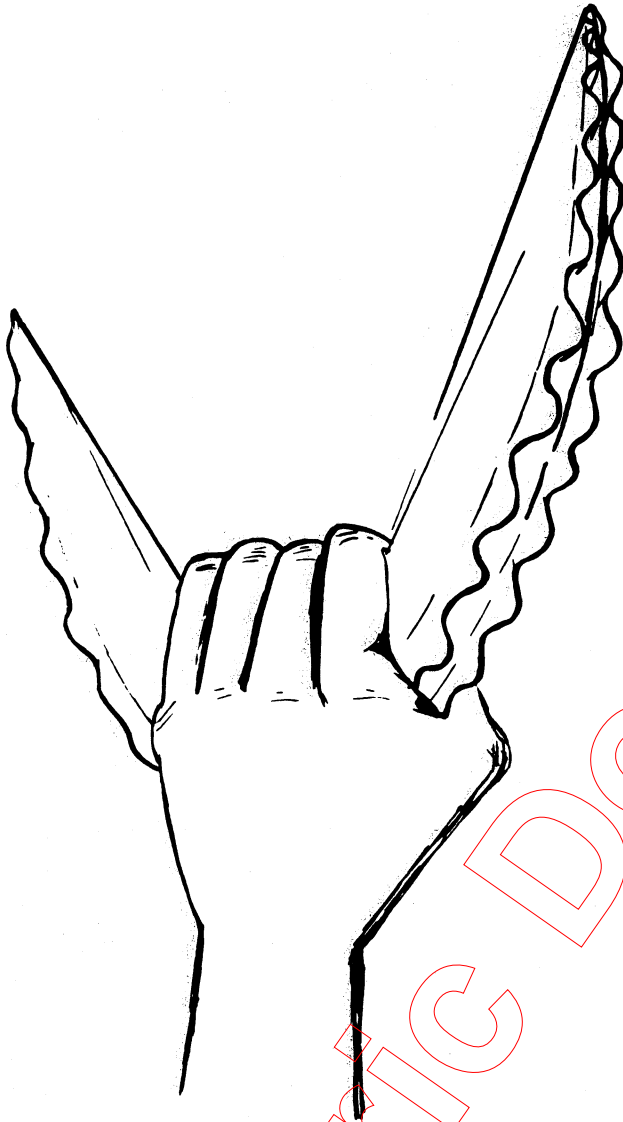


Figure 2. This is the procedure for installing an air seal into a pressure tank. Make sure the plastic funnel is placed in the hole before inserting. This will prevent damage to the seal.

hole or larger (see figure 4). These devices will form an air seal between the air and the water and thus prevent the water from absorbing the air. Users say a charge of air may last from 3 to 7 years. A valve core must be installed in the tank or in the line near the tank so air can be admitted into the system with a hand pump or an air compressor when needed. The method of installation will not only solve the water-log problem but also the excess air situation, as where a slug of water knocks the glass out of your hand into the sink or lavatory.

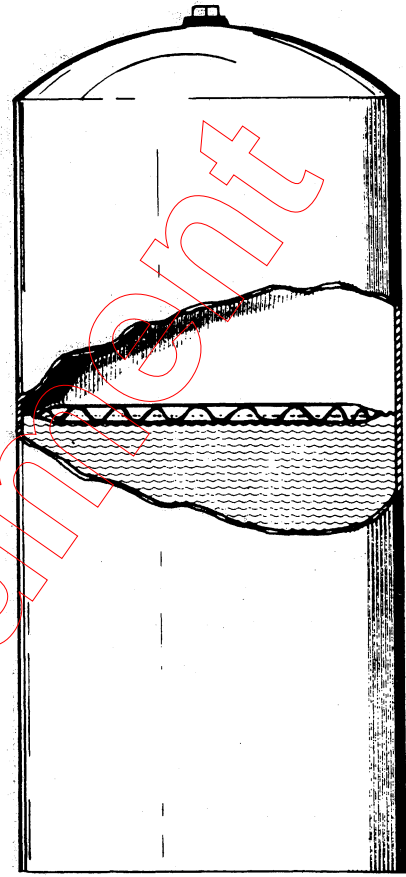


Figure 3. An air seal installed in a pressure vertical tank

A tee connection should be used at the tank so water will not pass through the tank (see figure 5). The tank merely "rides" the line, acting as an air cushion to the system as well as a reserve to keep the water line pressure within limits. This will also keep any sediments that may be in the bottom of the tank from being stirred up when the pump runs. The old air volume control and air pump, if any, should be removed and each opening should be sealed air-tight.

New pressure tanks may be purchased with the air seal already installed for only a few dollars more than the price of a plain tank. Most water systems may be converted to a closed system. The only requirement is that the tank be in vertical position and have a 1-1/4 or 1-1/2 inch diameter hole in the tank. The size seal needed will depend on the diameter of the tank.



Figure 4. Proper installation of an air seal in a pressure tank

Eliminating the introduction of air directly to the water will also help the problem

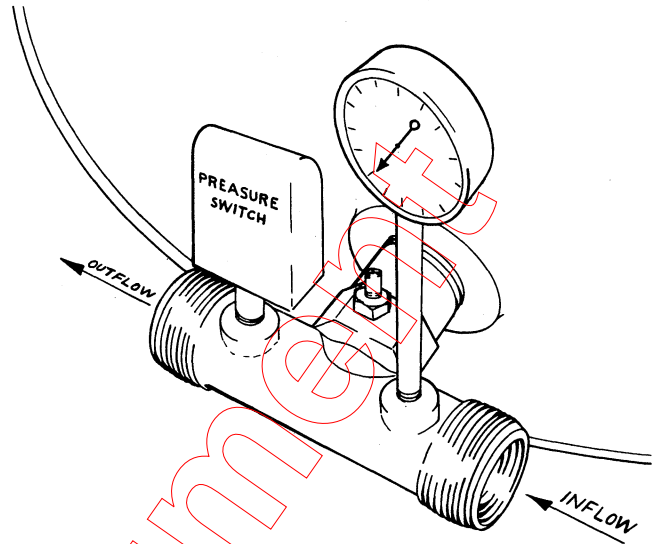


Figure 5. Correct installation of a pressure tank in a water system

of rust in the water. Most iron in well water is in solution. The water is clear but when the water comes in contact with the air, the iron is oxidized and becomes cloudy. With this method of air seal installation, air is not readily mixed with the water. This does not infer that all iron problems will be solved, but it will tend to reduce trouble. If iron is present in amounts of 3 ppm or greater, an iron filter should be used in the system.

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