



Quality Watch

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Milking Systems Performance

Following is part of our milking systems performance series of articles penned by members of the MMPA Milking Systems Performance Assurance Team. These articles highlight handy tips and recommendations to members to keep their milking systems functioning properly. MMPA Member Representative Steve Lehman wrote the helpful tips below.

The Vacuum Regulator Installation

A properly installed, properly functioning, and well-maintained vacuum regulator is a crucial part of any milking system. This article focuses on some tips to make sure you are getting the most out of your vacuum regulator.

Types of Vacuum Regulators

There are three basic types of vacuum regulators – diaphragm, weighted, and the spring poppet type. Of these, the diaphragm vacuum regulator is the most common and best suited for all milking systems. The weighted and spring poppet types are less sensitive to vacuum changes, and are not recommended, especially in pipeline systems. The manner of operation of all three of these types is the same – atmospheric air is admitted to the vacuum system to maintain a set vacuum level. The use of a variable frequency drive for the vacuum pump is another manner in which milking vacuum may be regulated. The payback time on the investment in the drive will vary from farm to farm, depending on the daily hours of usage.

Proper installation of the vacuum regulator is extremely important. The manufacturers' instructions are quite explicit in this regard, and should be followed closely. Regulators or their sensing devices should be installed as close to the cow as possible. In a pipeline system, this is as close to the sanitary trap as possible. This is also the preferred location of the sensor for a variable frequency drive system. In a bucket system, the regulator should be installed between the vacuum distribution tank and the first stallcock on the pulsator line. The installation point should be in an area where the regulator is easily accessible for service.

The point at which the vacuum regulator senses the vacuum level varies among brands. The weighted, spring poppet, and some diaphragm type regulators will sense the vacuum level at the base of the regulator itself. Other diaphragm type vacuum regulators have a sensing tube or sensing unit that "reads" the vacuum level at a point away from where the regulator admits air.

Some critical points that must be followed when vacuum regula-

tors of this style are installed. First, the distance between the sensing point and the point of air admission must be kept within the limits set by the manufacturer. Restrictions in the sensing tube size are not allowed. Sensing tube restrictions caused by fastening the tube too tightly with cable ties are the most common. The location of the sensing point in relationship to the point of air admission is also critical. The point of air admission to the vacuum system should always be between the vacuum pump and the sensing point. If the air admitted by the vacuum regulator is allowed to flow by the sensing point, the sensitivity to changes in the milking system vacuum level is reduced, and improper vacuum level control results.

Function

Most diaphragm type vacuum regulators will respond to a .2" drop in vacuum level, providing they are installed properly and properly maintained. If the vacuum level of your milking system drops over .5", and the vacuum regulator is still admitting air, you have a problem that should be addressed. The exceptions to this statement are the black Sen-

tin regulators, which admit some air for lubrication. A change in the set vacuum level from milking to milking (or during a milking) is also a common sign of a vacuum regulator problem. There are some simple tests that can be used to determine if your vacuum regulator is performing properly. Your equipment dealer or MMPA Member Representative can perform these tests for you.

Maintenance

Vacuum regulators are relatively easy to maintain. The main point of maintenance is cleaning. All vacuum regulators, regardless of design, should be cleaned on a monthly basis. Cleaning the filter does not constitute a complete job of cleaning. The entire regulator should be cleaned according to the manufacturer's instructions. Some parts, such as diaphragms and seals,

should be replaced periodically. If you do not have a manual for your regulator, contact your equipment dealer or MMPA Member Representative.

Vacuum Regulators and Variable Frequency Drives

On some farms, variable frequency drive vacuum pumps have replaced vacuum regulators as the primary means of controlling the milking vacuum level. The regulator then takes on a secondary function, and should not be eliminated. It should be set at a point approximately 1" higher than the milking vacuum level, and acts as a safety valve in the event of failure of the VFD. In addition, the vacuum regulator should be used as the means of controlling the vacuum level during the cleaning cycles. The reason for this is twofold. First, it can enhance

the cleaning of the milking system somewhat by operating at a constant, higher vacuum level. Also, by allowing the vacuum regulator to operate during the wash cycle, it reduces the likelihood that it will "lock up" and not perform in case the VFD fails. Maintenance is also important – the vacuum regulator should be maintained just as if it were the primary method of controlling the milking vacuum level.

We hope that you find these articles relating to your milking system useful in your efforts to continue producing high quality milk. If you have any questions, suggestions, or comments, please address them to Steve Lehman via the Novi office, or by e-mail at lehman@mimilk.com.



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