

AGRICULTURAL GUIDE

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Dairy Cows

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Preventing shocks to cows in milking parlors

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A stray alternating electrical current of about $\frac{1}{2}$ volt causes cows to be nervous and reluctant to enter parlor stalls; they also may shift around more and withhold milk.

Stray electricity sources are either *on-farm* or *off-farm*. On-farm sources include faulty circuits, poor connections, overloaded circuits, and faulty equipment. Work with the local power company to solve off-farm sources of stray electricity, such as from faulty equipment on a nearby farm.

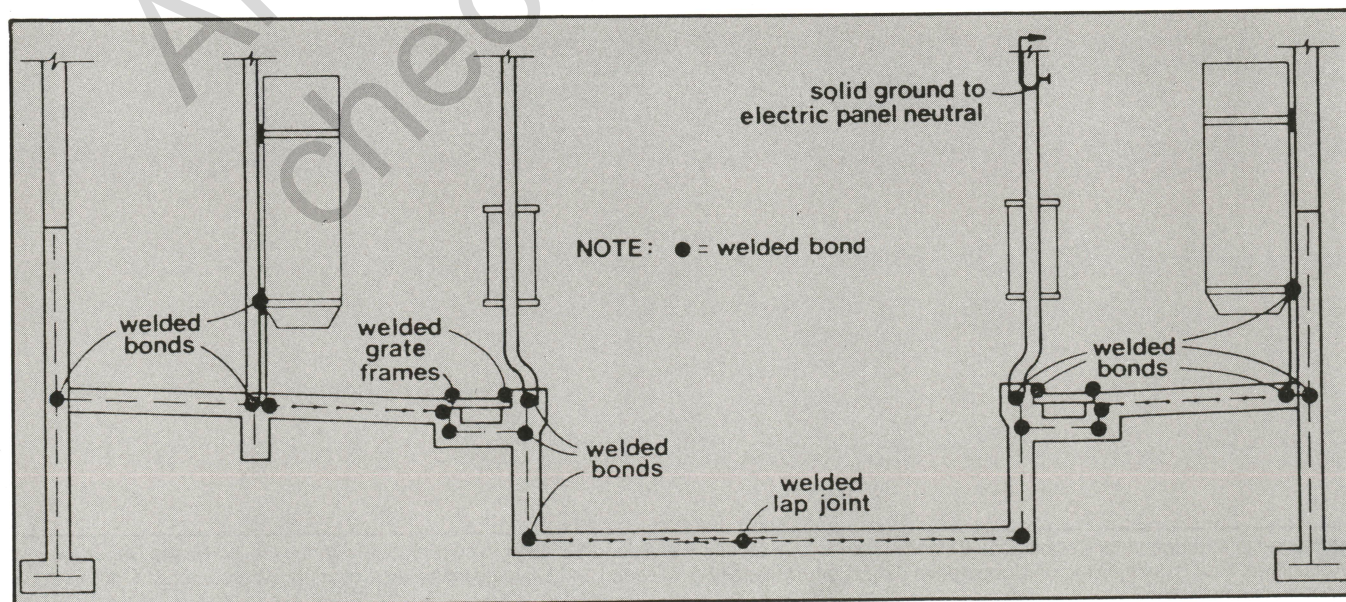
Voltage differences from the primary neutral (company supply to the transformer) to the secondary neutral (supply on the customer's side of the transformer) can also be a source of stray electricity in the dairy barn.

Proper bonding of the metal parts of a parlor will help eliminate stray electricity in the parlor. This guide gives ideas for preventing electric shocks in parlors to be built as well as in existing facilities.

New facilities

Bonding all of the metal (conductive) materials of the stalls should prevent any possibility of an electric current flowing through the cow because bonding prevents voltage differences. For example, metal in the concrete floor may have $\frac{1}{2}$ volt, while the metal stall may have one volt. If conductive materials aren't bonded, the current may flow through the cow to equalize voltage.

Bonding may be needed at points shown.



Bonding as defined in the National Electrical Code means the permanent joining together of metallic parts to form an electrically conductive path, which will assure electrical continuity and the capacity to conduct safely any current likely to be present.

Such bonding must be done when the parlor is built. Weld reinforcing steel at joints and also to all other metal either in or above the concrete. Bond reinforcing steel and all metal parts above the concrete. The diagram shows points where bonding may be needed.

In addition to this bonding, clamp a copper conductor (No. 8 or larger) securely to the stalls and run it without interruption to the neutral bar of the milking parlor service panel.

Bonding will help prevent the electric current from shocking the cow in the stall. It does not prevent the cow from receiving a shock when she steps from the holding pen into the parlor, where there may be a difference in voltage.

NOTE: Install all electrical wiring according to the National Electrical Code.

Existing facilities

First, bond all exposed metal parts of an existing parlor. Even after the stalls, metal piping, grates, and other conductive materials have been bonded, the floor may still cause a problem. If so, cover it with a non-conductive material such as epoxy; you may need a new concrete surface.

New concrete surfaces should be at least 1½ inches thick with wire-mesh reinforcing embedded. The reinforcing material should be welded or securely clamped at joints, and it should also be welded or otherwise made in dependable electrical contact with the stalls.

Clamp a copper conductor (No. 8 or larger) securely to the steel stalls and run it without interruption to the neutral bar of the service panel of the parlor.

Another alternative is to cut parallel grooves 6 inches apart down the length of the cow platform. Imbed heavy copper wire in the grooves, covering wire with a grout and tying to the parlor stalls and to service panel neutral. Be sure an eight-foot ground rod is driven and connected to the service panel neutral.