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SERVICE BULLETIN

EMERSON Process Management

Number: SE-39, Revision: 02 **December 2001**

Brooks Compact Prover/Optical Switch Replacement

The following procedure should be used when replacing detector switches on the Brooks Compact Prover. This procedure applies to provers retrofitted with the "plug-style" optical assembly.

1. Disconnect electrical power.
2. Remove the support bracket at the outboard end of the detector shaft dust cover.
3. Remove the dust cover.
4. Carefully cut wire ties holding plug to frame for inoperative switch. Remove any "hoop-style" anchors necessary. Disconnect plug from main harness by releasing latch and separating plug. See Appendix A for reference.
5. Remove the mounting/adjustment screws holding the optical switch assembly to the switch pad. See Appendix A.
6. Carefully remove the switch assembly while feeding the switch plug through the frame. Be careful not to catch the plug on any other wires. They are very delicate.
7. Install the new switch. For a volume switch, ensure that the assembly base is positioned flat against the switch pad and square against the right end of the pad where the elongated holes are located.
8. Adjust the switch position so that the detector passes through the center of the switch. If necessary, loosen the bearing housing and slide it along the shaft while adjusting the switch position. It may be necessary to pry the bearing housing free from the optical shaft by using a small screwdriver in the rear slot. Return the bearing housing to its original position and tighten all screws.
9. Plug the switch back into the main harness, feeding the plug back through the frame to the original location. Anchor plug to the frame using a new wire tie and replace any "hoop-style" wire anchors.
10. Verify that the wires will not interfere with the movement of the detector.
11. Replace the dust cover and support bracket.

If the switch replacement procedure has been performed correctly, the replacement switch will be within 0.001 inch from the original switch position. The following formula can be used to determine the degree of change in the waterdraw volume.

Example:

For a 12-inch prover:

Waterdraw volume change for 0.001 inch of switch movement =

$$\pi r^2 (0.001) = \pi \left(\frac{12.25}{2} \right)^2 (0.001) = 0.1178 \text{ cu in}$$

Since 15 gallons = 3465 cubic inches:

$$\text{The percentage change } = \frac{0.1178}{3465}(100) = 0.0034\%$$

The 0.0034% change in the waterdraw volume is well within the 0.02% allowed.

Similar changes can be expected in the other size provers:

Prover Size	Percent of Change
8-inch standard	0.0046%
12-inch mini	0.0051%
18-inch standard	0.0035%
24-inch standard	0.0034%

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