

# switches

## External switch seals, boots provide plethora of advantages

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### APM HEXSEAL®

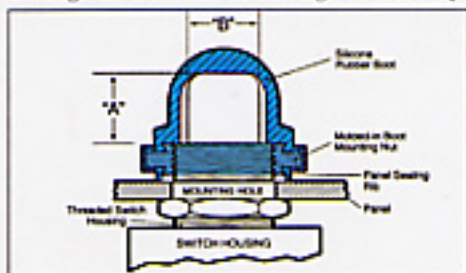
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In many applications, panel-mounted switches are subject to hostile environments that may compromise their reliability and system performance. Dust, dirt, grease, lubricating oils, cleaning solvents, rain, snow, washdowns and salt water are just a few of the harmful contaminants that may result in contact corrosion and switch failure.

Boots are often used with both unsealed and internally-sealed switches to protect behind-panel components from leakage around the switch bezel and through the panel cutout.

Under such conditions, reliable switch performance can be achieved using a separate external seal or boot designed to protect the switch mechanism and seal the panel cutout in which the switch is mounted. These switch boots offer a number of advantages over other methods of sealing switches, including:

- External switch boots and seals used with a conventional (unsealed) switch mechanism are generally less costly than alternative switch sealing techniques.
- A damaged or torn switch boot is highly visible, whereas failure of alternative forms of switch sealing is often not evident until the environmental contaminant has already rendered the switch inoperable and resulted in system damage.
- Discrete switch seals and boots are relatively inexpensive and easy to replace and they permit use of relatively inexpensive conventional (unsealed) switches.
- One manufacturer's external switch boots are designed with an integral perimeter sealing rib. This seals the panel cutout, protecting behind-panel components and circuits from damage as a result of leakage or blow-by.



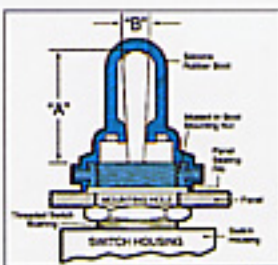
Typical pushbutton seal arrangement.

These boots are often used with both unsealed and internally-sealed switches to protect behind-panel components from leakage around the switch bezel and through the panel cutout.

• Switch boots are reusable: in the event of switch failure, conventional (unsealed) switch replacement is generally less costly than replicating the original form of switch sealing.



Boots are available in black, yellow, gray, blue, red, clear (transparent), green, white and other colors.



Typical toggle switch seal arrangement.

The switch style is important. What type of panel-mounted switch needs to be sealed: toggle, pushbutton, rotary, rocker or other?

Dimensional considerations are critical:

- What size threaded bushing does your switch use (e.g., 15/32-32, 3/8-24, 3/8-27, 1/4-40, etc.)?
- What is the height of the tip of the switch actuator above the threaded switch bushing?
- If a toggle or pushbutton switch is used, what is the maximum diameter of the actuator?
- If a rotary switch is used, what is the diameter of the rotary shaft?
- If a rocker switch is used, what are the



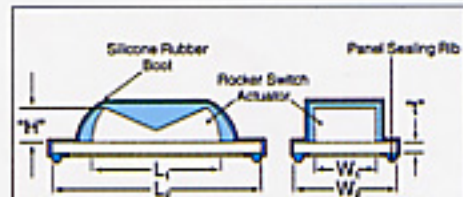
Reliable switch performance can be achieved using a separate external seal or boot.

dimensions of the bezel and actuator, and the height of the rocker above the plane of the bezel surface?

Material considerations are also important:

- What color switch seal do you require? Available are black, yellow, gray, blue, red, clear (transparent), green, white and more.
- What is the nature of the hostile environment: dust and dirt, grease, cleaning solvents, salt water, jet fuel, rain or snow?
- What are the maximum and minimum operating temperatures to which the switch and its seal will be exposed?
- Must the switch seal be MIL-SPEC or QPL-listed?
- If a toggle switch is used, are the detent forces relatively light or heavy? Light detent force is typical of plastic switches and heavy force is typical of metal devices.

Standard seals are available for a wide variety of manufacturers' catalog switches and can usually be specified by supplying the switch maker's part number.



If a rocker switch is used, you need to know the dimensions of the bezel and actuator, and height of the rocker above the plane of the bezel surface.

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