

## Pushbutton Boots

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The use of pushbutton boots began in the defense industry, where switches for military equipment required protection from myriad harsh environments, such as deserts, jungles, oceans, and snow/ice. To prevent reliability issues or failure of these switches, APM Hexseal developed our own product line of sealing boots to respond to the military's growing need for switch protection. All our seals comply with the military design specifications set forth in MIL-DTL-5423: *General Specification for Boots, Dust and Moisture Seal (For Toggle and Push-Button Switches, Circuit Breakers, and Rotary-Actuated Parts)*.

A pushbutton switch is actuated by a push or press motion. Pushbutton boots, as their name suggest, are sealing boots that are used to cover pushbutton switches. Pushbutton boots are typically manufactured from silicone rubber and act as armor for pushbuttons. These boots are used as pushbutton switch covers that protect these devices from harmful external factors such as dirt, water, salt, oil, solvents, humidity, and other particulates.

### Types of Sealing Boots

In addition to pushbutton switches, sealing boots are also available for toggle and rotary type switches. Toggle switches are operated by a mechanical lever, rocking system, or handle (similar to a conventional light switch). Conversely, rotary switches are actuated by a rotating motion and can have two or more operating states. Each sealing boot is manufactured with features that facilitate the unique movement of each switch type.

### Benefits of Using Pushbutton Boots

Hermetically sealed and standard unsealed pushbutton devices that operate under challenging environmental conditions require silicone boots to ensure maximum switch reliability and minimal maintenance and repair costs. Although ingress protection (IP) rated switches provide some degree of defense against the intrusion of foreign matter, they may not always supply an adequate safeguard due to their inherent vulnerabilities.

Moisture, salt, and cleaning solvents can penetrate the actuator mechanism and come into contact with internal contacts, resulting in corrosion or fungus buildup. Ice, dirt, and dust can accumulate on the actuator well and impede free movement of the switch. In addition, cleaning solutions and spilled liquids can seep past the mounting hole and travel down the bushing threads, negatively affecting the internal circuitry. These problems also exist in hermetically sealed pushbutton switches.

Pushbutton boots address these problems due to their single-piece construction, which protects all areas of the switch in even the most demanding environmental conditions. These boots also feature mounting nuts which encompass the base of the switch to create a full 360-degree airtight seal.

### Pushbutton Boots Have Uses in Many Industries

Industries that perform switching operations in outdoor environments will see significant benefits when using weatherproof pushbutton switches. These include myriad sectors ranging from military and defense to home appliances. Pushbutton boots are also used to prevent the intrusion of foreign materials in sensitive equipment in the medical and pharmaceutical industries.

Some common applications of sealing boots include, but are not limited to:

- Instrumentation panels
- Communication switches
- Consumer electronics
- Heavy machinery control panels
- Control panels in aircraft and spacecraft
- Telecommunications network equipment

### Sealing Solutions You Can Rely On

APM Hexseal manufactures sealing solutions for switches and circuit breakers for a wide variety of industries. Our products are designed to significantly extend the serviceable life of switches in some of world's most challenging operational environments.

We offer a wide range of boots for the sealing of pushbutton switches of all styles and sizes. If you would like to know more about our sealing solutions and how they can protect your sensitive equipment, feel free to **contact us** or **request a quote** today. Our team is waiting to assist you in finding a sealing solution that fits the unique needs of your operation.

#### MATERIAL SPECIFICATIONS For APM Hexseal® Standard Threaded Pushbutton Boots

Mounting Nut: Brass, Nickel Plated  
 Elastomer: Silicone conforms to A-A-59588, Class 3A, GR50 †, Gray ‡  
 Temperature Range: -103° F to +400° F (-75° C to +204° C)  
 Resistant to: Splash, salt spray, sunlight, ozone, weather, fungus, dust, and most acids and lubricating oils.  
 Shelf Life: Excess of 25 years.

† Durometer options available. Please contact APM Hexseal® for details.  
 ‡ Additional color options available. Please contact APM Hexseal® for details.

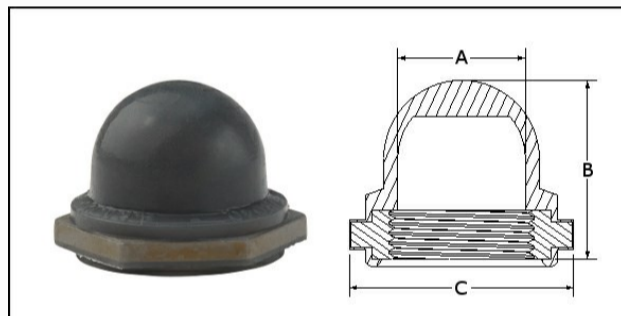


Fig 1

### Pushbutton Boots with Hex-Shaped Insert Fig.1

*Click table to enlarge*

APM Hexseal Part #	Military Part #	Thread Size	Max Plunger Height (Above Bushing)	Internal Diameter (A)	Height (B)	Hex Size/Outer Diameter (C)	System of Measurement				
1231/B	-	3/8-27 UNS-2B	0.397"	10.08mm	0.300"	7.62mm	0.653"	16.59mm	0.500"	12.70 mm	Imperial
1231/35	-	3/8-32 UNEF-2B	0.418"	10.62mm	0.300"	7.62mm	0.670"	17.20mm	0.500"	12.70 mm	Imperial
1231/51	-	3/8-27 UNS-2B	0.665"	16.88mm	0.313"	7.95mm	0.875"	22.23mm	0.500"	12.70 mm	Imperial
1238/155*	-	15/32-32 UNS-2B	0.306"	7.77mm	0.422"	10.72mm	1.008"	25.60mm	0.750"	19.05mm	Imperial
N3030	M5423/07-01	15/32-32 UNS-2B	0.281"	7.14mm	0.422"	10.72mm	0.547"	13.89mm	0.625"	15.88mm	Imperial
N3030 RFI †	M5423/07-06	15/32-32 UNS-2B	0.281"	7.14mm	0.422"	10.72mm	0.547"	13.89mm	0.625"	15.88mm	Imperial
N3040	M5423/07-04	5/8-24 UNEF-2B	0.281"	7.14mm	0.515"	13.08mm	0.609"	15.47mm	0.750"	19.05mm	Imperial
N5040	M5423/10-03	1/4-40 UNS-2B	0.141"	3.58mm	0.188"	4.78mm	0.313"	7.95mm	0.375"	9.53mm	Imperial
N5040G	M5423/10-01	1/4-32 UNEF-2B	0.203"	5.16mm	0.188"	4.78mm	0.313"	7.95mm	0.375"	9.53mm	Imperial
N5040R	M5423/10-02	1/4-40 UNS-2B	0.203"	5.16mm	0.188"	4.78mm	0.313"	7.95mm	0.375"	9.53mm	Imperial
N5045	-	8-40 UNS-2B	0.188"	4.78mm	0.120"	3.05mm	0.297"	7.54mm	0.250"	6.35mm	Imperial
NC3030	M5423/07-02	15/32-32 UNS-2B	0.438"	11.13mm	0.422"	10.72mm	0.719"	18.26mm	0.625"	15.88mm	Imperial
NC3030 7/16-28	-	7/16-28 UNEF-2B	0.438"	11.13mm	0.374"	9.50mm	0.719"	18.26mm	0.625"	15.88mm	Imperial
NC3030FL ‡	-	15/32-32 UNS-2B	0.520"	13.21mm	0.344"	8.74mm	0.797"	20.24mm	0.625"	15.88mm	Imperial
NH3030	M5423/07-03	1/2-32 UN-2B	0.281"	7.14mm	0.422"	10.72mm	0.547"	13.89mm	0.625"	15.88mm	Imperial
NC3030HM12x1	-	M12 x 1.6H	0.469"	11.90mm	0.422"	10.72mm	0.734"	18.64mm	0.625"	15.88 mm	Metric

\* Armored Pushbutton Boot. (No image shown.)  
 † Pushbutton Boot with EMI/RFI Shielding. (No image shown.)  
 ‡ Flat Top Pushbutton Boot.

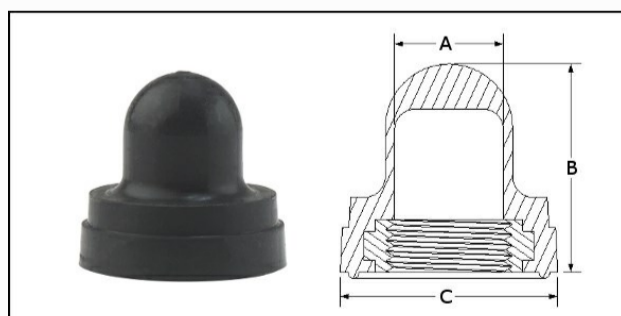


Fig 2

### Pushbutton Boots with Round Insert Fig.2

*Click table to enlarge*

APM Hexseal Part #	Military Part #	Thread Size	Max Plunger Height (Above Bushing)	Internal Diameter (A)	Height (B)	Hex Size/Outer Diameter (C)	System of Measurement				
C1221/22	-	3/8-24 UNF-2B	0.330"	8.40mm	0.320"	8.13mm	0.609"	15.47mm	0.640"	16.26mm	Imperial
C1221/24*	-	3/8-27 UNS-2B	0.419"	10.64mm	0.300"	7.62mm	0.609"	15.47mm	0.640"	16.26mm	Imperial
C1221/25	-	3/8-27 UNS-2B	0.419"	10.64mm	0.300"	7.62mm	0.609"	15.47mm	0.640"	16.26mm	Imperial
C1221/21 M10	-	M10 x 1.6H	0.330"	8.40mm	0.320"	8.13mm	0.609"	15.47mm	0.640"	16.26mm	Metric
C1221/27	-	M11 x 1.6H	0.267"	6.78mm	0.320"	8.13mm	0.609"	15.47mm	0.720"	18.29mm	Metric

\* Boot is made from APM Hexseal's clear RUBRGLAS™

#### Sealing Boots & Bushings

- Toggle Boots
- Pushbutton Boots
- Rotary Boots
- Circuit Breaker Boots
- Rocker Boots
- Bushing Seals

#### Sealing Hardware

- Sealscrews & Seelbolts
- Seelnuts
- Seeloc Washers

#### Contact

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