

ENGINEERING INFORMATION RELEASE

TO: Engineering
Marketing

FROM: Don Clemens

DATE: May 8, 1961

SUBJECT: 8909NB TO-3 INSULATING COVERS

INTRODUCTION

This information is being presented in order to answer questions regarding fit problems which occasionally arise with our 8909NB insulating covers for TO-3 devices. Our intent is to explain the limitations of the part as well as possible solutions to the problem.

DISCUSSION

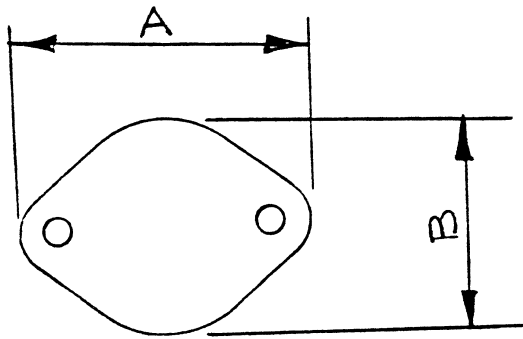
With any snap-in or snap-on part, tolerances between mating parts must be closely controlled to maintain desired retention. In the case of our 8909NB cover, we have the necessary control of our part dimensions but have no control of its mating part, the TO-3 device. TO-3 dimensions are governed by dimensions given and tolerances stated by various standards organizations and manufacturers. This quite large tolerance puts a limitation on the number of TO-3 devices which can be used with our 8909 cover.

When fit problems do occur, the reason is because the TO-3 case is too large to accept our cover. So the obvious solution is to produce a larger cover. There are two ways to do so.

One is simply mold a larger cover. This solution would require a costly mold, would force us to have to inventory two sizes of the same part, and would require the customer to select the correct one for his application which could possibly require both sizes. So you can see, all things considered, this solution might cause more problems than it solves.

The other solution is to enlarge our existing product. There are three processes by which this can be done. The part can be heated, it can be soaked in water, or both. A hot air gun can be used to heat the part until it has properly expanded to fit a given TO-3. Care must be taken not to overheat the part.

Another process is to soak them in tap water. We did an informal test here and are presenting the following graph as an indication of what dimensional changes can be expected by this process.



DIMEN.	DRIED AT 100°C 4 DAYS	AFTER 6 HOUR SOAKING	AFTER 6 HOUR SOAKING	AFTER 24 HOUR SOAKING
A	1.577	1.592	1.590	1.606
B	<u>1.032</u>	<u>1.057</u>	<u>1.065</u>	<u>1.064</u>
TOT.	2.609	2.649	2.655	2.670
CHANGE*	100%	101.5%	101.8%	102.3%

*% CHANGE FROM DRY CONDITION CONSIDERING DRY CONDITION 100%

The third process is to immerse the parts in boiling water. This is much quicker than soaking in tap water and offers assurance against overheating which is possible when heating with a hot air gun.

Some questions have arisen regarding the effect moisture has on the electrical properties. The two properties of primary concern are volume resistivity and dielectric constant.

In a dry condition, the nylon we use has a volume resistivity of about 10^{15} ohms/cm which drops to about 10^9 ohms/cm in the fully saturated condition. The part would have to be boiled in water for about 300 hours to reach saturation, so it is safe to say that 10^9 ohm/cm is a lower than usual value.

When the part is equilibrated to 50% relative humidity, the dielectric constant value is approximately 7 at 100 Hz.

Don Clemens

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