

# Technical Disclosure Commons

---

Defensive Publications Series

---

December 2021

## Self-Fastening Washer

Follow this and additional works at: [https://www.tdcommons.org/dpubs\\_series](https://www.tdcommons.org/dpubs_series)

---

### Recommended Citation

"Self-Fastening Washer", Technical Disclosure Commons, (December 19, 2021)  
[https://www.tdcommons.org/dpubs\\_series/4791](https://www.tdcommons.org/dpubs_series/4791)



This work is licensed under a [Creative Commons Attribution 4.0 License](https://creativecommons.org/licenses/by/4.0/).

This Article is brought to you for free and open access by Technical Disclosure Commons. It has been accepted for inclusion in Defensive Publications Series by an authorized administrator of Technical Disclosure Commons.

## Self-Fastening Washer

### Background

Figs. 1-3 depict a known D-ring assembly for a seatbelt. The D-ring assembly includes a D-ring stamping, a pillar loop ring, a pillar loop cover, a bolt, a spacer and a push nut. The bolt fastens the D-ring assembly to a vehicle. Certain push nuts, such as the one shown in Fig. 3, includes teeth for engaging threading on the bolt. The push nut, when engaged to the bolt, helps hold the spacer on the bolt and helps retain the bolt extending through the D-ring stamping, the pillar loop cover, and the pillar loop wing.

Known push nuts are at risk from detaching from or moving along the bolt from a desired position on the bolt during manufacturing and/or when the D-ring assembly is transported.

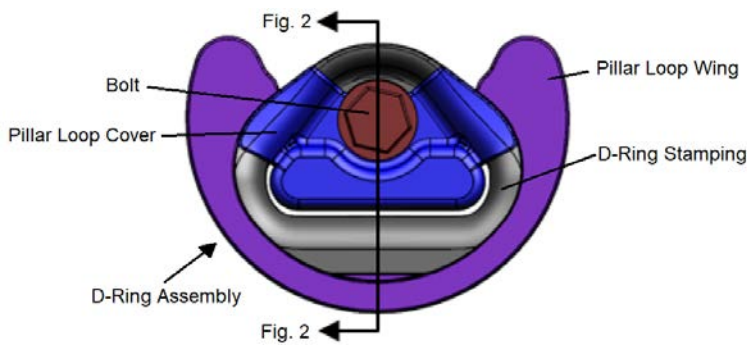


Fig. 1 – Assembled D-ring Assembly

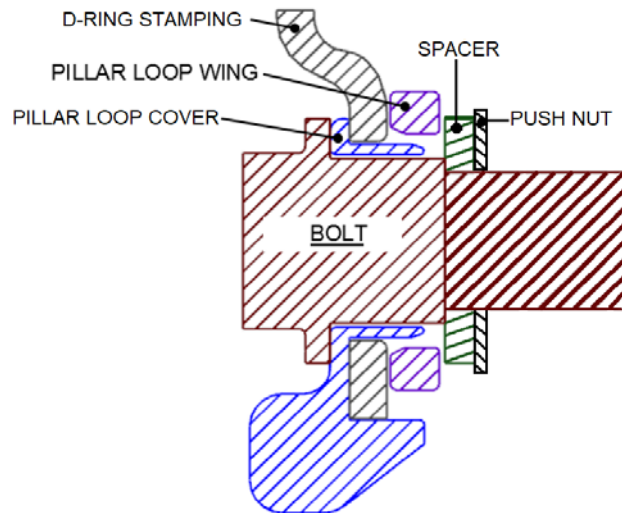


Fig. 2 – Cross-Sectional View of D-Ring Assembly of Fig. 1



Fig. 3 – Components of the D-ring Assembly of Figs. 1-2

**Present Disclosure**

As shown in Figs. 4-5, the present disclosure provides a self-fastening washer that combines the functionality of the known spacer and the known push nut into a single washer. As shown in Fig. 4, the self-fastening washer may be configured to bottom out on a portion of the bolt utilized in the D-ring assembly and function as a spacer when the D-ring assembly is joined to a vehicle. The self-fastening washer also functions as a push nut and, thus, may include at least one internal engagement feature for engaging the bolt. The at least one internal engagement feature may be, for example, threading or at least one projection/tooth for engaging the threading on the bolt. Although the self-fastening washer shown in Fig. 5 has two opposing straight sides and two opposing curved sides, the self-fastening washer may be keyed for tooling and formed in any desired shape.

The self-fastening washer of the present disclosure may provide the following benefits:

- 1) reduces the risk of a binding condition during installation of the D-ring assembly in seatbelt applications that may occur when a spacer and push nut combination is utilized;
- 2) eliminates the risk of a push nut or similar fastener from falling off the bolt during assembly and/or transport;
- 3) simplifies the design of the D-ring assembly by eliminating the requirement of a push nut or similar fastener;
- 4) saves on manufacturing costs by providing one piece (the self-fastening washer) in the place of two separate pieces (a push nut and a spacer); and
- 5) decreases scrap rate and quality concerns in the manufacturing facility.

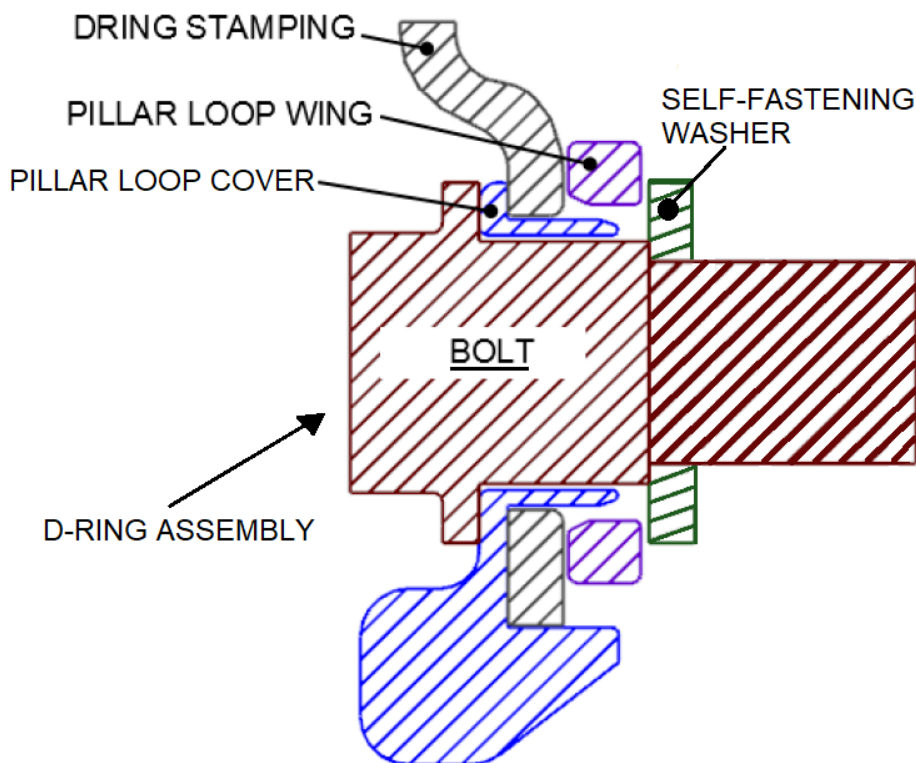


Fig. 4 – Cross-Sectional View of D-Ring Assembly having the Self-Fastening Washer of the Present Disclosure

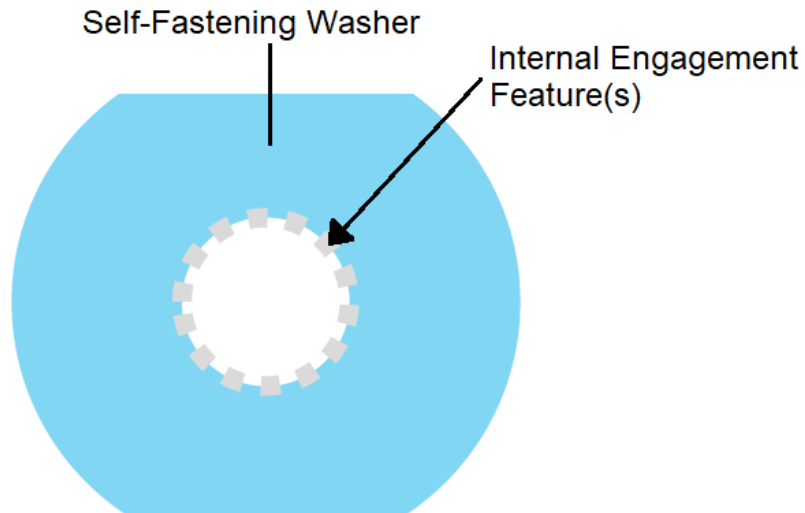


Fig. 5 – Example Configuration of the Self-Fastening Washer of the Present Disclosure

Use of the self-fastening washer is not limited to D-ring assemblies. The self-fastening washer thus may have other vehicle-specific and/or non-vehicle-specific applications.