



US009409604B2

(12) **United States Patent**  
**Kargilis et al.**

(10) **Patent No.:** **US 9,409,604 B2**  
(45) **Date of Patent:** **Aug. 9, 2016**

(54) **PUSH PLUG WITH PASSIVE SEATING  
FEATURE AND INSTALLATION METHOD**

5,558,346 A 9/1996 Hartery  
5,709,309 A \* 1/1998 Gallagher ..... B62D 25/24  
137/849

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5,873,623 A 2/1999 Dunton et al.  
6,786,521 B1 9/2004 Jaffke et al.

**FOREIGN PATENT DOCUMENTS**

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DE 10245486 A1 4/2004  
FR 2955078 A1 7/2011

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**OTHER PUBLICATIONS**

(\* ) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 89 days.

International Search Report and Written Opinion dated Feb. 9, 2016  
for International Application No. PCT/US2015/056605, Interna-  
tional Filing Date Oct. 21, 2015.

\* cited by examiner

(21) Appl. No.: **14/559,961**

(22) Filed: **Dec. 4, 2014**

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(65) **Prior Publication Data**

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US 2016/0159403 A1 Jun. 9, 2016

(51) **Int. Cl.**  
**B62D 25/00** (2006.01)  
**B62D 25/02** (2006.01)  
**B62D 65/02** (2006.01)

(57) **ABSTRACT**

(52) **U.S. Cl.**  
CPC ..... **B62D 25/02** (2013.01); **B62D 65/024**  
(2013.01)

A vehicle panel assembly and related method are provided. The vehicle assembly includes a push plug that is movable between a pre-installed position and an installed position where the push plug is aligned with a hole in a vehicle panel. A fastening post extends from the vehicle panel and is received in an aperture in the push plug. An engagement member projects from a side of the fastening post and retains the push plug on the fastening post when the push plug is in the pre-installed position. The aperture is larger than the fastening post in at least one dimension such that the engagement member of the fastening post does not retain the push plug when the push plug is in the installed position. This allows the push plug to fall from the vehicle panel if the push plug is improperly installed in the hole.

(58) **Field of Classification Search**  
CPC ..... B62D 25/02; B62D 65/024  
USPC ..... 296/1.06, 191, 146.1  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

3,606,446 A 9/1971 Leslie  
4,363,420 A 12/1982 Andrews  
5,505,324 A \* 4/1996 Danico ..... B62D 25/24  
220/201

**20 Claims, 5 Drawing Sheets**

