

NOTE: Fastener manufacturers use different terminology to describe the parts of the blind rivet. The terms “mandrel,” “spindle,” and “stem” are often used interchangeably. For clarity, the word “stem” is used in this handbook and refers to the piece that is inserted into the hollow sleeve.

Friction-Locked Blind Rivets

Standard self-plugging blind rivets consist of a hollow sleeve and a stem with increased diameter in the plug section. The blind head is formed as the stem is pulled into the sleeve. Friction-locked blind rivets have a multiple-piece construction and rely on friction to lock the stem to the sleeve. As the stem is drawn up into the rivet shank, the stem portion upsets the shank on the blind side, forming a plug in the hollow center of the rivet. The excess portion of the stem breaks off at a groove due to the continued pulling action of the rivet gun. Metals used for these rivets are 2117-T4 and 5056-F aluminum alloy. Monel® is used for special applications.

Many friction-locked blind rivet center stems fall out due to vibration, which greatly reduces its shear strength. To combat that problem, most friction-lock blind rivets are replaced by the mechanical-lock, or stem-lock, type of blind fasteners. However, some types, such as the Cherry SPR® 3/32-inch Self-Plugging Rivet, are ideal for securing nutplates located in inaccessible and hard-to-reach areas where bucking or squeezing of solid rivets is unacceptable. [Figure 4-102]

Friction-lock blind rivets are less expensive than mechanical-lock blind rivets and are sometimes used for nonstructural applications. Inspection of friction-lock blind rivets is

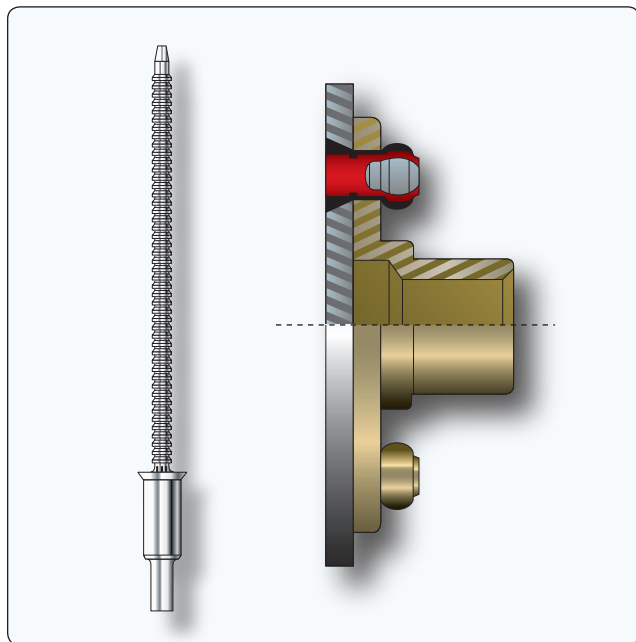


Figure 4-101. Friction-lock blind rivet.

visual. A more detailed discussion on how to inspect riveted joints can be found in the section, General Repair Practices. Removal of friction-lock blind rivets consists of punching out the friction-lock stem and then treating it like any other rivet.

Mechanical-Lock Blind Rivets

The self-plugging, mechanical-lock blind rivet was developed to prevent the problem of losing the center stem due to vibration. This rivet has a device on the puller or rivet head that locks the center stem into place when installed. Bulbed, self-plugging, mechanically-locked blind rivets form a large, blind head that provides higher strength in thin sheets when installed. They may be used in applications where the blind head is formed against a dimpled sheet.

Manufacturers such as Cherry® Aerospace (CherryMAX®, CherryLOCK®, Cherry SST®) and Alcoa Fastening Systems (Huck-Clinch®, HuckMax®, Unimatic®) make many variations of this of blind rivet. While similar in design, the tooling for these rivets is often not interchangeable.

The CherryMAX® Bulbed blind rivet is one of the earlier types of mechanical-lock blind rivets developed. Their main advantage is the ability to replace a solid shank rivet size for size. The CherryMAX® Bulbed blind rivet consists of four parts:

1. A fully serrated stem with break notch, shear ring, and integral grip adjustment cone.
2. A driving anvil to ensure a visible mechanical lock with each fastener installation.
3. A separate, visible, and inspectable locking collar that mechanically locks the stem to the rivet sleeve.
4. A rivet sleeve with recess in the head to receive the locking collar.

It is called a bulbed fastener due to its large blind side bearing surface, developed during the installation process. These rivets are used in thin sheet applications and for use in materials that may be damaged by other types of blind rivets. This rivet features a safe-lock locking collar for more reliable joint integrity. The rough end of the retained stem in the center on the manufactured head must never be filed smooth because it weakens the strength of the locking, and the center stem could fall out.

CherryMAX® bulbed rivets are available in three head styles: universal, 100° countersunk, and 100° reduced shear head styles. Their lengths are measured in increments of 1/16 inch. It is important to select a rivet with a length related to the grip length of the metal being joined. This blind rivet can be installed using either the Cherry® G750A or the newly released Cherry® G800 hand riveters, or either the pneumatic-