

Galling and Its Prevention

with Stainless Steel Fasteners

Installation Supplement 910

Stainless steel bolts and nuts occasionally seize or freeze together—a process is known as *galling* or *cold welding*. Fortunately, galling does not occur every day, but when it does, it is effectively irreversible. Serious delay and parts shortages can occur and tedious remedies are often required.

Such crises can be avoided by understanding galling and routinely adopting a few easy steps to prevent it.

What causes galling?

Galling can occur with fasteners made of stainless steel, aluminum, titanium, and other alloys that naturally form an oxide surface film. The film prevents corrosion, the major advantage of these fasteners.

When they are tightened, however, pressure builds between the thread surfaces of the bolt and nut, and the protective oxides are broken. The accumulating oxide shavings have rough edges, which can clog or lock together. This cumulative clogging-locking action creates increasing friction and heat. The metal expands, increasing the likelihood of galling.

Three-step prevention

When using stainless steel hardware common in Unirac products, adopt this easy, three-step routine to eliminate galling:

1. Apply the recommended Anti-Seize according to the manufacturer's direction located on the bottle or can. This step alone should completely eliminate galling. An Anti-Seize lubricant used on a bolt helps to develop greater clamp load for the same torque compared to an unlubricated bolt. An additional benefit is greater uniformity in clamp load for Stainless Steel Bolts. Unirac Inc. recommends Silver Grade LocTite Anti-Seize Item numbers: 38181, 80209, 76732, 76732, 76759, 76764, 80206 and 76775.
2. Keep nuts and bolts shaded prior to installation. Direct sun exposure at the work site, particularly on hot days, can heat hardware dramatically.
3. Decrease friction and heat by reducing the rate at which you turn the nuts and bolts. For example, do not spin the nuts down rapidly; do not use a high-speed setting on your driver. As the installation speed decreases, the heat that contributes to galling likewise decreases.



Installers who regularly use stainless steel fasteners should keep anti-seize in their toolboxes. Readily available cans often come with convenient applicators, such as this brush affixed inside the cap.



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