One-Time Use Fasteners

WHAT makes a fastener one-time use? This seems to be a popular question among insurers and collision repair technicians alike. After a fastener is removed, it looks the same, there is no damage, so why can't it be reused? This article will address this issue and describe the different types of one-time use fasteners, why a fastener is considered one-time use, and provide some vehicle-specific examples.

Types of One-Time Use Fasteners

One-time use fasteners are used in all areas of vehicle construction. Types of one-time use hardware include torque-to-yield bolts, coated fasteners, rivets, certain nylon retainers, some plastic clips, cotter pins, and even some washers. Whether hardware may be considered one-time use is generally determined by its type, coating, or location.

Torque-to-yield fasteners are designed to stretch. The stretching occurs during the torquing process. These fasteners become out-of-round and cannot be reused because of the excess amount of stress that was forced on them during installation. It is the design of this type of fastener that requires it be replaced after it has been loosened or removed.

To understand the stress that these bolts go through, here is an example of what occurs when replacing the cylinder head bolts on one vehicle maker's engine. The service manual gives a six-step process for each bolt. The steps must be done in a specific sequence and if the sequence is not followed, the bolt can break, causing damage and difficult removal. The six steps are as follows:

- Tighten to 40 N•m (30 ft-lb).
- Tighten an additional 90°.
- Loosen 360°.
- Tighten to 40 N•m (30 ft-lb).
- Tighten an additional 90°.
- Tighten an additional 90°.

These fasteners become misshapen and cannot be reused because of the excess amount of stress that was forced on them during installation.

Some fasteners have a specialized coating. This coating is used to protect the fastener from corrosion. For example, when attaching an aluminum panel, vehicle makers may use steel fasteners. This coating is designed to prevent galvanic corrosion. The coating is baked on and cannot be replaced or repaired by a technician. Therefore, if the coating is damaged, the fastener must be replaced (see Figure 1). The fastener must meet the standards of the vehicle maker, which is why it's important to not replace the fastener with just any coated fastener.

Other types of fasteners that are one-time use may include plastic clips that are designed to break or shear upon panel removal of trim pieces. For example, the 2005 Chevrolet Avalanche requires all the retaining clips to be replaced if the moulding is to be reused.

Rivets are also a one-time use fastener. A rivet is removed by drilling or tapping out the mandrel and replacing it with a new rivet, adhesive, or a combination of the two. When working with rivets, special tools may be required. For example, when removing a self-piercing rivet (SPR), some vehicle makers may recommend using a special tool that operates on pneumatic or battery power.

In addition to fasteners, some washers may need to be replaced after they have been removed, even if they do not show signs of damage. At least one vehicle maker says that all lock washers that are removed must be replaced with new ones. All lock washers that are removed on 2000 Hyundai vehicles must be replaced with new ones.

Identifying One-Time Use Fasteners

One-time use fasteners are used anywhere on the vehicle for a specific application that is identified in a repair procedure or with an icon in a service manual (see Figure 2). These fasteners may require replacement for safety reasons, fastener coating specifications, or insufficient reusable strength. Two fasteners with the same strength, thread pitch, and length may be used on a vehicle. One may require replacement and the other may not. For this reason, a service manual must be used to determine how removed fasteners should be treated.

Additionally, many parts are shipped with fasteners. Instead of storing these fasteners and reusing the existing fasteners, throw the old fasteners away, regardless of condition, and use the fasteners that are shipped with a part.

Examples of One-Time Use Fastener Locations

Parts that commonly use one-time use fasteners include:

- many steering and suspension parts.
- restraint system parts.
- driveline system parts.

A few vehicle-specific examples include the following:

- Rear driveshaft flange bolts for the 2004 Ford F-150
- Tie rod nut on the 2004 Ford F-150
- Passenger side airbag bolts on the 2000 Audi A4

Ford

The front bumper may be chrome plated or painted, depending on the option package. When removing the front bumper, the nuts that fasten the bumper to the frame bracket are one-time use and

should be replaced when reinstalling the bumper (See Figure 3).
All of the attachment clips are one-time use and must be replaced when the pickup box is reinstalled.
When replacing clips:

- use all replacement hardware. One-time use hardware may be included but unidentified. These types of fasteners must be replaced.
- use adhesives with clips when duplicating the OEM installation.
- drill all holes before refinishing to prevent corrosion.
- replace all clips that were damaged during removal. Order new hardware or remove it from inventory as soon as possible.

General Motors

General Motors uses prevailing torque fasteners, which are basically a torque-to-yield fastener. The prevailing torque fasteners may be made from either steel or nylon. They are designed to create a thread interface between the fastener and the fastener counterpart in order to prevent the fastener from loosening. These fasteners accomplish the thread interface by a designed distortion or deformation in the fastener. The nylon interface prevailing torque fasteners accomplish the thread interface by using a nylon material on the fastener threads.
General Motors also uses adhesive-coated fasteners. These fasteners accomplish the thread interface by using a thread-locking compound on the fastener threads.
Regardless of which type of fastener is used, refer to the appropriate repair procedure in order to determine if the fastener may be reused and the applicable thread-locking compound to apply to the fastener.

Conclusion

Determining whether a fastener is one-time use is rarely a decision left up to the repairer. The vehicle maker provides very specific recommendations regarding how fasteners should be treated and there are rarely general recommendations regarding which fasteners are one-time use. This may vary from vehicle maker to vehicle maker, vehicle to vehicle, or even from one model year to the next. For this reason, it's important to always refer to the vehicle maker's service information when replacing parts. For more information on general use of fasteners, refer to the January-February 1996 issue of the I-CAR Advantage. Also, I-CAR offers an in-depth discussion of fasteners in the Trim and Hardware programme (TRM01).

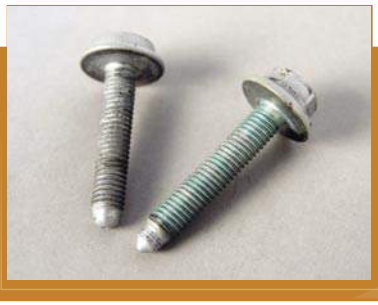

FIGURE 1

Here are examples of coated fasteners. The left fastener has damage to the coating, requiring replacement while the fastener on the right is undamaged.

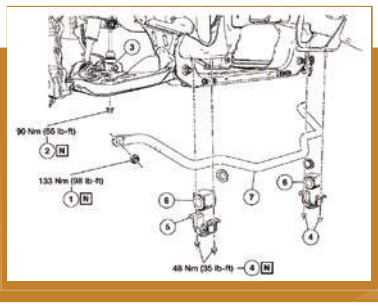

FIGURE 2

The "N" icon in the Ford manual indicates that the fastener must be replaced with a new fastener.

FIGURE 3

These are body support mount bolts with adhesive that are used on the Ford F-150. These bolts must be replaced if loosened or removed.

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