

## Velocity Washer Operation Guide

### Quick Notes

- Velocity Washers must be used on the side of the bolt that the torque wrench is applied to. This applies to both torque-up and breakout. Only one Velocity Washer is used per bolt.
- Do not lubricate the velocity washer where it contacts the flange. Otherwise, follow normal lubrication procedures for installing and torquing the nut.
- Never attempt to loosen a velocity washer equipped bolt unless you intend to activate the velocity washer.
- Avoid using the edge of a Velocity Washer as a reaction point for a wrench.
- Do not install a flat washer on top of or underneath a Velocity Washer.
- Do not reuse a Velocity Washer after it has activated.
- Cannot be used on left-handed threads

### Installation

1. Clean the flange area around the stud of any oils, lubricants, or debris.
2. Place the Velocity Washer on the stud directly against the flange on the side that the wrench will be used on.
3. Lubricate the top of the Velocity Washer if the standard torque-up procedure requires it.
4. Thread the nut onto the bolt and snug it against the Velocity Washer.
5. If the stud is not blind, prepare the opposite side according to standard procedure.
6. Torque the nut on top of the Velocity Washer clockwise according to existing procedures.

### Breakout

1. To activate the Velocity Washer, apply torque counter-clockwise to the nut on top of the Velocity Washer.

### Velocity Washer General Operation

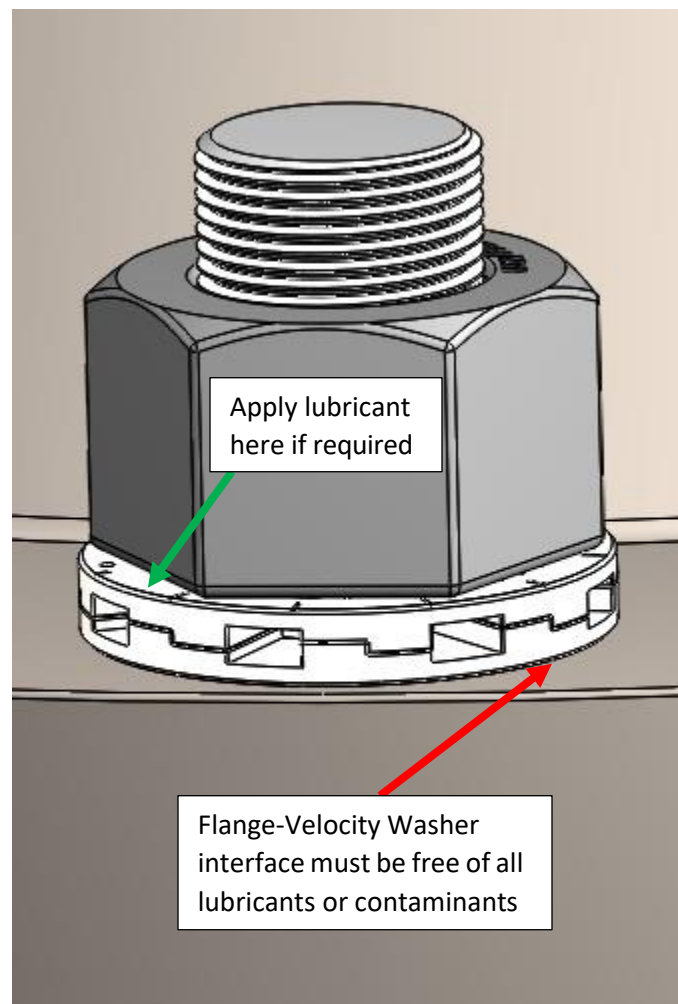
Velocity Washers are load-relief devices that do not require special tooling or modification to normal torquing procedures when installed correctly. Velocity Washers replace flat washers on one side of the bolt. They activate by collapsing in on themselves when the nut they are underneath is rotated counter-clockwise. After activation, the reduced height of the Velocity Washer relieves bolt tension, leaving the nut loose and ready to be removed by hand or by a nut runner. If the Velocity Washer fails to activate for any reason, the integrity of the bolted connection is unaffected and the nut can be removed by continuing to rotate the nut loose. Velocity Washers deform during activation and cannot be reused.

Velocity Washers are installed as flat washer replacements. They are symmetrical and have no directionality. The nut-facing surface of the velocity washer may be lubricated in order to comply with existing torquing procedures. The flange-side surface of the Velocity Washer must NOT be lubricated under any circumstance. The flange must be clean of oils, loose debris, or other contaminants before the Velocity Washers are installed. Minor damage to the surface of the flange is not a concern unless it prevents the Velocity Washer from sitting flat and perpendicular to the bolt. Do not use a flat washer underneath or on top of a Velocity Washer; the Velocity Washer must be in direct contact with both the flange and the nut.

Velocity Washers must be installed on the same side of the flange that the torque wrench will be applied to for both torque-up and breakout. Any fastener with a Velocity Washer installed cannot be loosened without causing activation under most circumstances. Torque-up is completely unaffected by the presence of Velocity Washers and can occur in as many stages as needed so long that the wrench is used on the same side that the Velocity Washer is installed on. Installing a Velocity Washer on the opposite side of the flange that the wrench is used on will result in it activating during torque-up. However, it is possible to use a Velocity Washer with a tensioner installed on the opposite side of the flange, which may be the only configuration possible depending on the bridge clearance of the tensioner around the Velocity Washer.

Refer to the Velocity Washer specifications for application guidelines. Exceptionally long or short bolts may be unsuitable for Velocity Washers.

## Diagrams



*Figure 1: Lubrication of properly installed Velocity Washer*

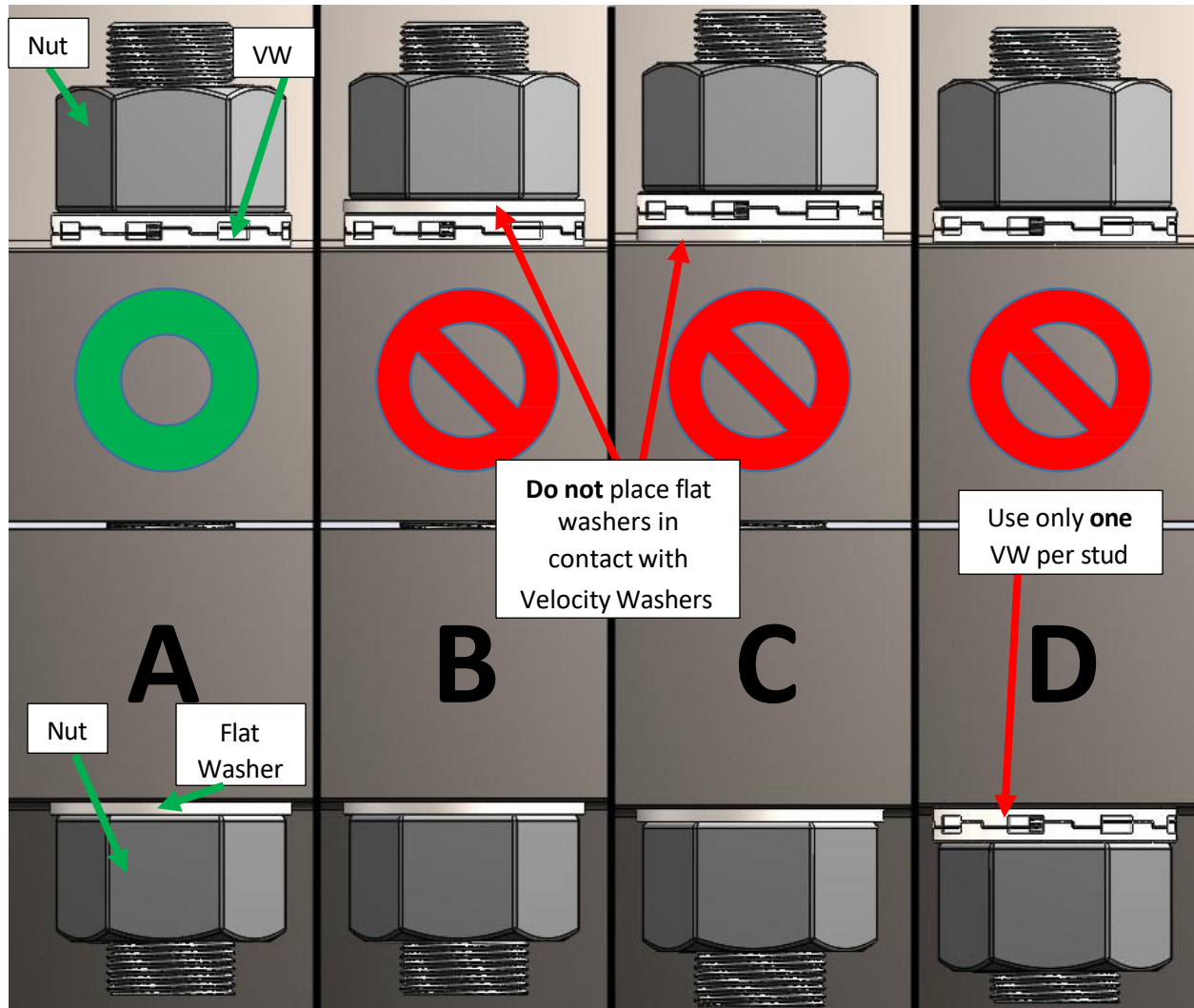
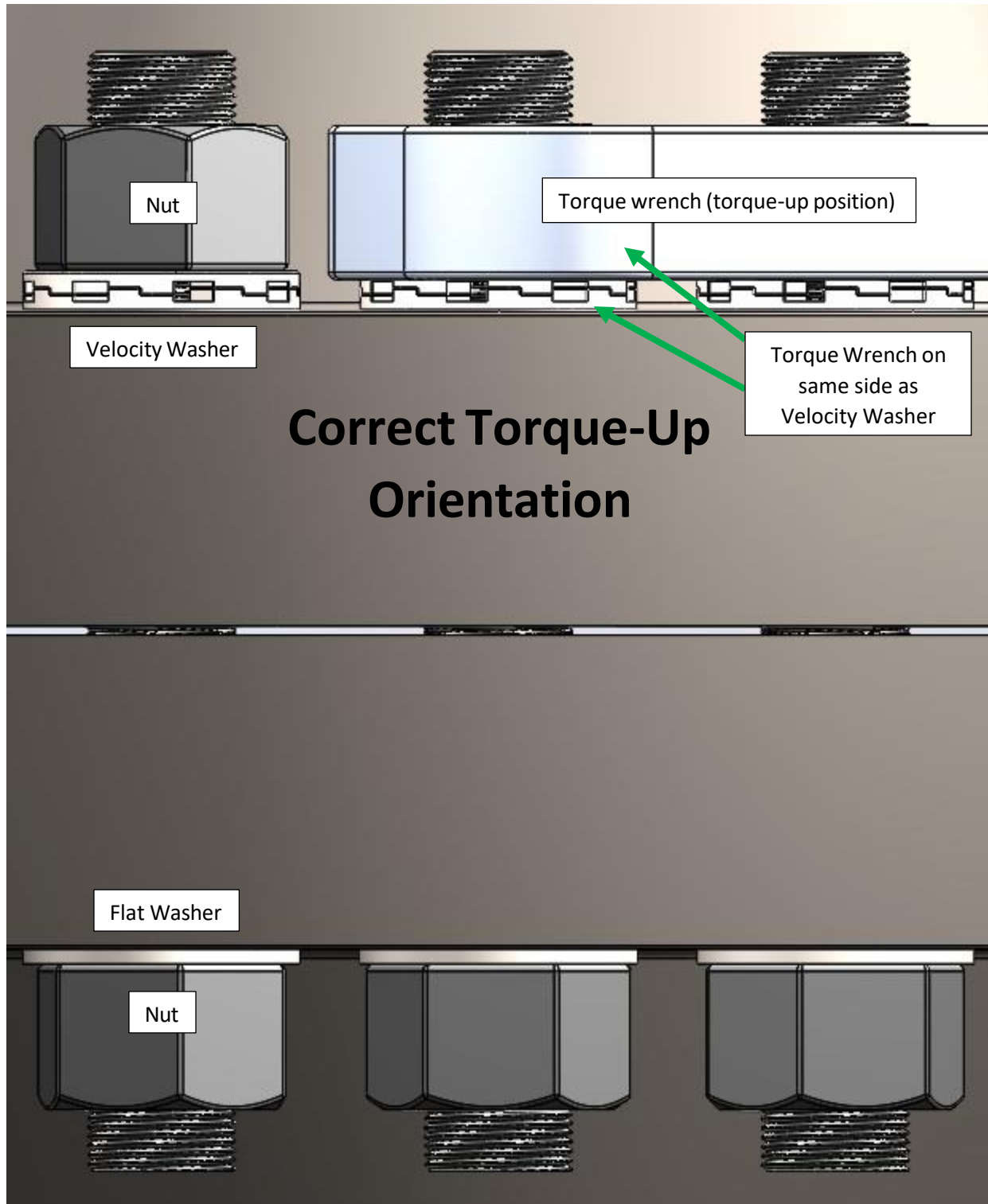
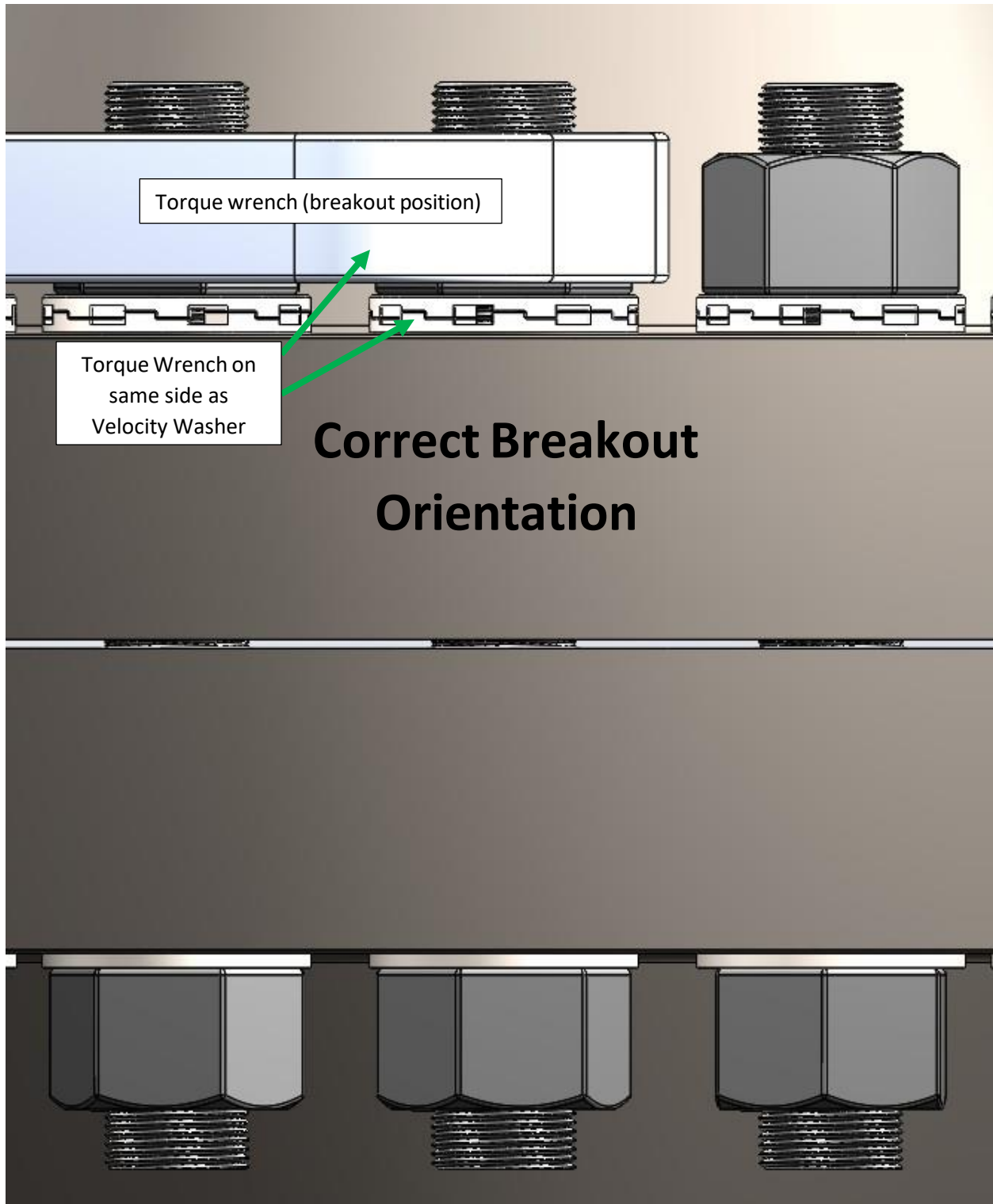


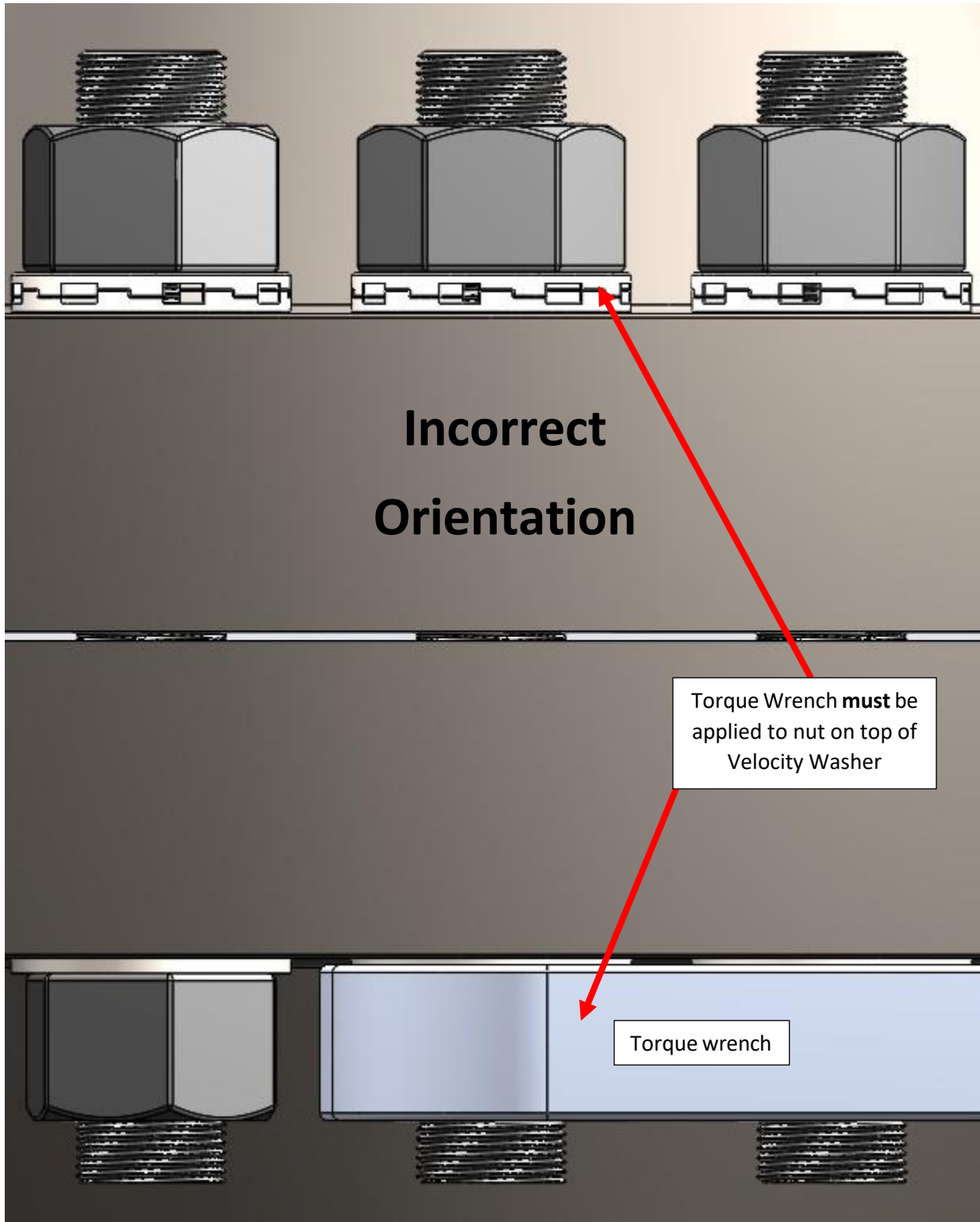
Figure 2: Correct and incorrect Velocity Washer Installation. A depicts correct installation; one Velocity Washer on one side of the bolted joint and a flat washer on the other. B is incorrect, as a flat washer has been installed between the nut and the Velocity Washer. C is incorrect because a flat washer has been installed between the flange and the Velocity Washer. D is incorrect because a Velocity Washer can only be installed on one side of the bolted joint.



*Figure 3: Correct orientation of Velocity Washer, torque wrench, and bolt system for torque-up. The Velocity Washers are installed on the same side that the torque wrench is applied to. No washers are placed on the same side as the Velocity Washer. The opposite side of the bolt is a standard washer and nut pair.*



*Figure 4: Correct orientation of Velocity Washer, torque wrench, and bolt system for breakout. The Velocity Washers are installed on the same side that the torque wrench is applied to. No washers are placed on the same side as the Velocity Washer. The opposite side of the bolt is a standard washer and nut pair.*



*Figure 5: Incorrect orientation of Velocity Washer and torque wrench on flange. The torque wrench must be applied to the nut that the Velocity Washer is installed on. Attempting to apply torque in the orientation depicted will cause premature activation of the Velocity Washer.*

The Velocity Washer™ trademarks, patent, and all associated intellectual property are owned by Velocity Bolting Inc., and used by INTEGRA Technologies Limited under license.