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## INSTALLATION INSTRUCTIONS

### FOR ZAP SCREWLOK TRANSITION TYPE 2 AND EPOXY COUPLERS ON GRADE 60 REBAR AND UNCOATED ASTM A615, GRADE 75\* REBAR [U.S. METRIC GRADE 420 (UNCOATED GRADE 520), CANADIAN GRADE 400]

Slide the **ZAP SCREWLOK TRANSITION** coupler over the larger rebar\* end until the rebar touches the positive center stop of the coupler, as shown in Figure 1. Do not under-insert as shown in Figure 2. If the coupler is specially supplied **without** a center stop or if the center stop is removed, measure and mark the larger rebar for “ $l_L$ ” insertion before inserting it into the coupler per Figure 3 and Chart 1.

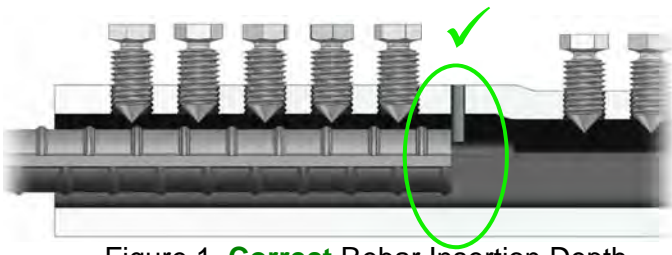


Figure 1. **Correct** Rebar Insertion Depth

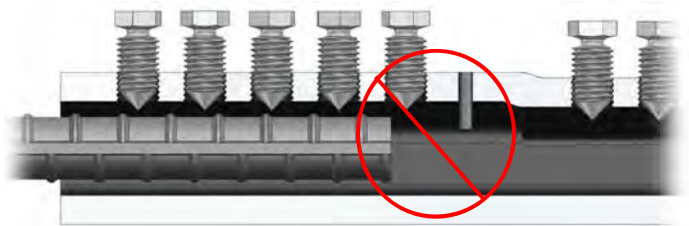


Figure 2. **Incorrect** Rebar Insertion Depth

Using an **impact wrench** and a socket “S” per Chart 1, tighten the break-off screws starting **at the end** of the coupler and working your way **toward the middle** of the coupler. Tighten each screw until the head of the screw **twists off**. See Chart 1 for approximate twist-off torque. **THE CORRECT IMPACT WRENCH TORQUE RATING MUST BE USED WHEN INSTALLING THIS PRODUCT.** For **best performance** and **ease of installation**, Barsplice recommends the use of a ¾ inch drive pneumatic **impact wrench** and suitable socket. Make sure the impact wrench is rated to achieve at least the minimum impact wrench torque specified in **CHART 1** to avoid stalling. The **air supply** line should have a minimum diameter of ½ inch. The air compressor should be large enough to provide **100 psi** (7 bar) gauge pressure & deliver 45 cfm of air flow.

For illustration purposes only.  
See **CHART 1** on page 3 for number of screws and twist-off torque.

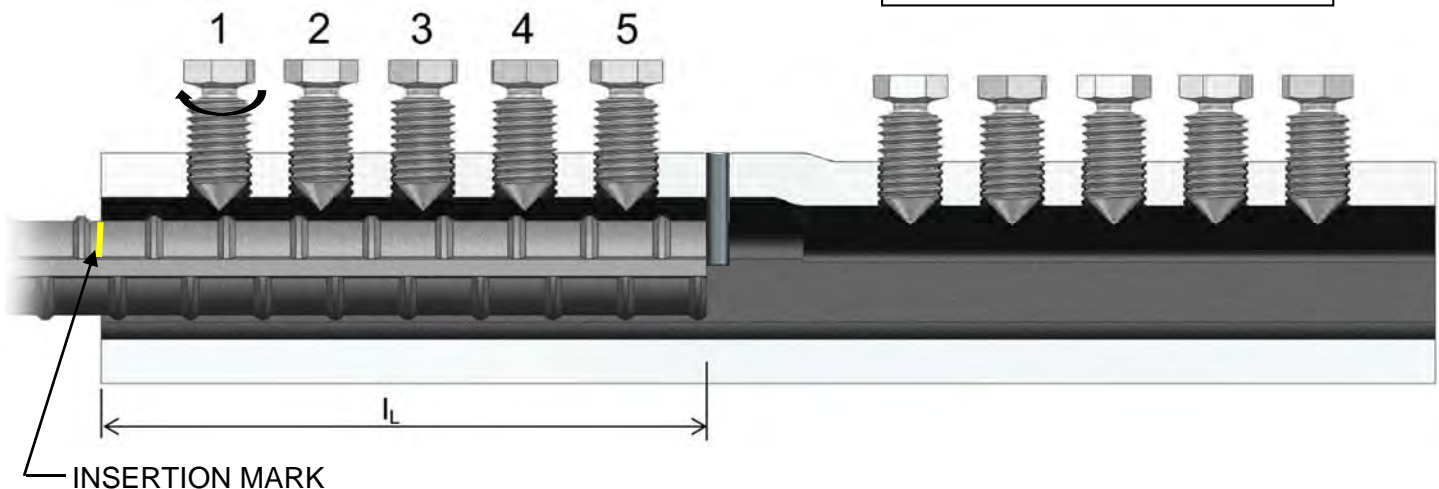


Figure 3. **Correct** Tightening Order, 1<sup>ST</sup> Side

\*CONTACT BPI FOR APPROPRIATE COUPLERS TO CONNECT DUAL-CERTIFIED GRADE 75/GRADE 100 LOW CARBON CHROMIUM STEEL BARS THAT CONFORM TO ASTM A1035.

Once the screws on the first side have been tightened down and heads broken off, **insert the smaller** rebar into the transition coupler until it butts up **against the center stop** per Figure 4. If the coupler has no center stop, insert the smaller rebar\* until it butts up **against the larger rebar**. In the **same order** as the first side, tighten the screws until the heads break off working from the end of the coupler toward the middle of the coupler.

For illustration purposes only.  
See **CHART 1** on page 3 for number of screws and twist-off torque.

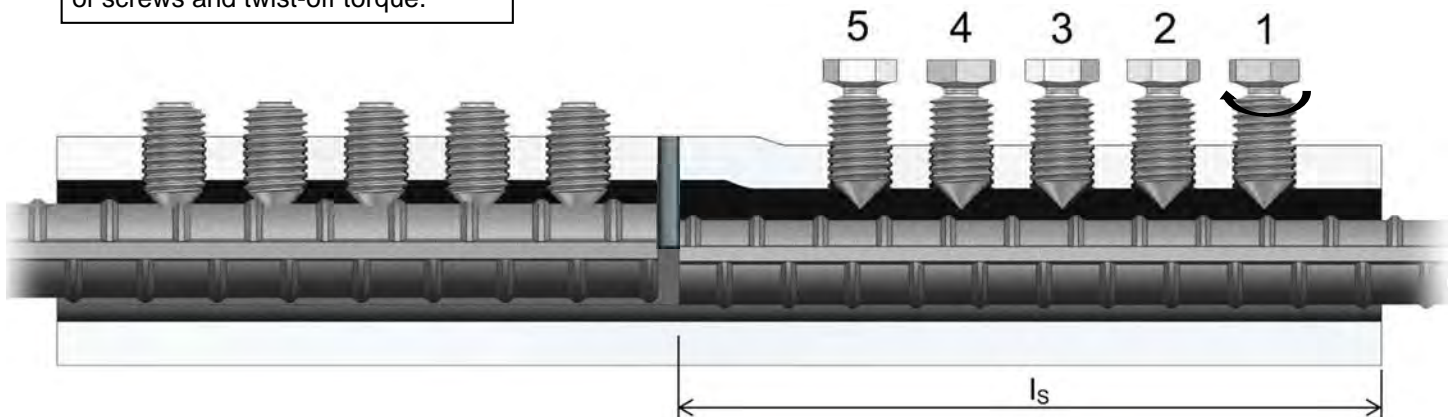


Figure 4. **Correct** Tightening Order, 2<sup>nd</sup> Side

● NOTE: Make sure to insert the larger rebar into the larger side of the transition coupler and the smaller rebar into the smaller side of the coupler. The larger side of the coupler requires “ $l_L$ ” rebar insertion which is less than the smaller side “ $l_S$ ” rebar insertion (see CHART 1 for rebar insertions).

OTHER THAN THE TRANSITION BAR SIZES SPECIFICALLY LABELED ON THE COUPLERS, DO NOT USE THIS PRODUCT IN CONJUNCTION WITH REBAR WHICH IS LARGER OR SMALLER THAN THE INTENDED BAR SIZE. CONTACT BPI FOR THE APPROPRIATE TRANSITION SPLICES. DO NOT SWITCH SCREWS BETWEEN THE LARGER AND SMALLER SIDES OF THE TRANSITION COUPLER. **KEEP COUPLERS CLEAN AND KEEP THREADS RUST FREE, PER FIGURE 5. STORE COUPLERS IN A CLEAN, DRY PLACE UNTIL READY TO INSTALL. RUST IN THE THREADS PRIOR TO ASSEMBLY, PER FIGURE 6, IS UNACCEPTABLE BECAUSE IT COULD RESULT IN LOWER PERFORMANCE OF THE ASSEMBLED SPLICE.**



Figure 5. Clean **Acceptable** Coupler



Figure 6. **Unacceptable** Rust in Coupler Threads

**CHART 1**

REBAR SIZE US [metric]	LARGER REBAR INSERTION "IL" (in.)	SMALLER REBAR INSERTION "IS" (in.)	NUMBER OF SCREWS PER BAR	SOCKET SIZE "S"	AVERAGE SCREW TWIST-OFF TORQUE "T" (ft-lb)	MINIMUM IMPACT WRENCH TORQUE RATING (ft-lb)
* #4/3 [13/10]	3 ½	3 ½	3	½	60	250
#5/4 [16/13]	3 ½	4 ½	3	½	60	250
* #6/4 [19/13]	4 ½	5 ½	4	½	60	250
#6/5 [19/16]						
#7/5 [22/16]	5 ¾	6 ½	4	⅝	105	500
#7/6 [22/19]						
#8/6 [25/19]	6 ½	7 ⅝	5	⅝	105	500
#8/7 [25/22]						
* #9/7 [29/22]	7 ⅞	8 ¾	5	¾	215	750
#9/8 [29/25]						
* #10/7 [32/22]	8 ¾	9 ½	6	¾	215	750
* #10/8 [32/25]						
#10/9 [32/29]						
* #11/7 [36/22]	8 ¾	9 ½	6	¾	215	750
* #11/8 [36/25]						
#11/9 [36/29]						
#11/10 [36/32]	9 ½	10 ¾	7	¾	215	750

\* REQUIRES LONGER LENGTH SCREWS ON THE SMALLER BAR SIDE OF TRANSITION COUPLER

▼ Example of suitable impact wrench is Ingersoll Rand, IR 261

## CAUTIONS AND SUGGESTIONS

1. **Do not use** an open-ended wrench or an adjustable wrench because of the risk of rounding-out the hexagon head prior to reaching the torque needed to twist-off the head.
2. Prior to assembly, straighten excessively bent rebar ends so that proper wedge contact is made between rebar and coupler. BAR ENDS should be straight to within ⅛ inch in 18 inches. For curved rebar with a diameter that exceeds 54 feet, a bar end straightness check is not necessary. If needed, grind-off large shear lips that prevent proper insertion of rebar into coupler. **DO NOT USE THIS PRODUCT ON CURVED COLUMN REBAR ENDS.**
3. If removal of the center stop is necessary, use a hammer and punch or large nail to tap it out of the coupling body.
4. Replace missing screws immediately with BPI special screws only. **DO NOT ALLOW THREADED HOLES TO RUST.**
5. If rebars are corroded, removal of rust/corrosion must be performed to the same degree as that required to bond with concrete prior to installing the Zap coupler. Testing of old or severely corroded bars is recommended to ensure the integrity of the adjoining bars and compliance to design requirements. Performance statements of Zap couplers are based upon the use of ASTM **A615/A706**, Grade 60 rebar or uncoated ASTM A615, Grade 75 rebar.
6. For Epoxy Coated ASTM A775/A775M rebar, use the pre-epoxy coated ZAP SCREWLOK EPOXY SERIES couplers supplied by Barsplice Products, Inc. Touch-up coating damage and the sheared surfaces of screws with a suitable epoxy patching kit after assembly. **DO NOT APPLY FUSION-BONDED EPOXY POWDER COATINGS TO UNCOATED COUPLERS or HEAT THE COUPLERS FOR THE PURPOSE OF EPOXY COATING. DO NOT HOT-DIP GALVANIZE UNCOATED COUPLERS. DO NOT ALLOW ABRASIVE BLAST MATERIAL TO COME INTO CONTACT WITH UNASSEMBLED THREADS.**
7. In all cases, consider your own **personal safety**. Make sure you are securely positioned and that you will not slip or fall during installation.

Please direct all assembly questions to BarSplice Products, Inc.

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## INSTALLATION INSTRUCTIONS FOR #14, #18 ZAP SCREWLOK TRANSITION TYPE 2 AND EPOXY COUPLERS ON GRADE 60 REBAR [U.S. METRIC GRADE 420]

Slide the **ZAP SCREWLOK TRANSITION** coupler over the larger rebar\* end until the rebar touches the positive center stop of the coupler, as shown in Figure 1. Do not under-insert as shown in Figure 2. If the coupler is specially supplied **without** a center stop or if the center stop is removed, measure and mark the larger rebar for "IL" insertion before inserting it into the coupler per Figure 3 and Chart 1.

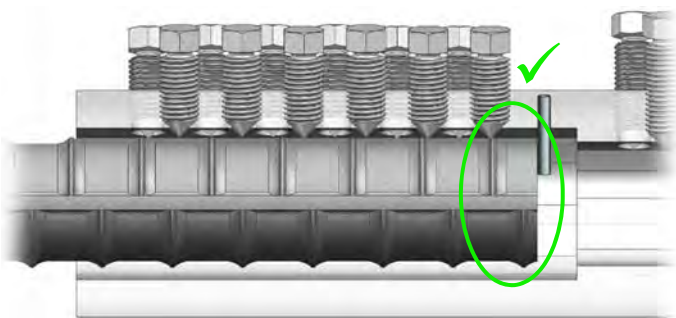


Figure 1. **Correct** Rebar Insertion Depth

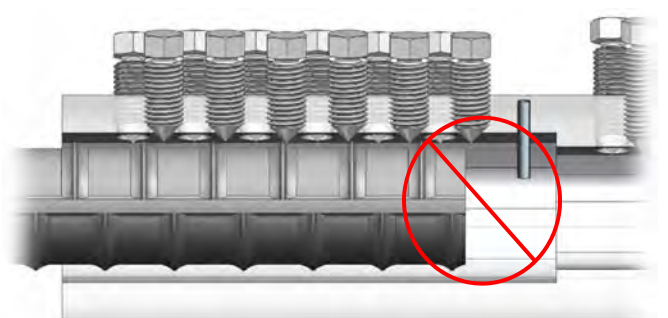


Figure 2. **Incorrect** Rebar Insertion Depth

Using an **impact wrench** and a socket "S" per Chart 1, tighten the twist-off screws starting **at the end** of the coupler and working your way **down one row toward the middle** of the coupler. Tighten each screw until the head of the screw **twists off**. See Chart 1 for approximate twist-off torque. After all the heads have been twisted off on the first row, repeat the procedure down the second row, starting at the end and working your way toward the middle of the coupler.

For illustration purposes only.  
See **CHART 1** on page 2 for number of screws and twist-off torque.

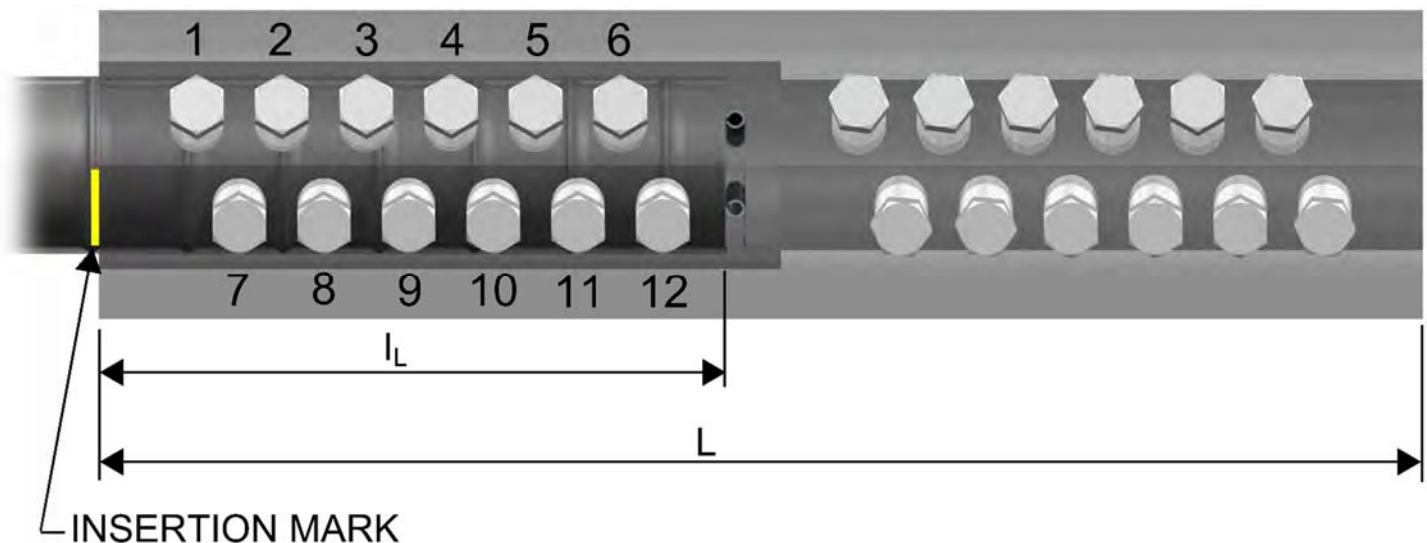


Figure 3. **Correct** Tightening Order, 1<sup>ST</sup> Side

\*CONTACT BPI FOR APPROPRIATE COUPLERS TO CONNECT DUAL-CERTIFIED GRADE 75/GRADE 100 LOW CARBON CHROMIUM STEEL BARS THAT CONFORM TO ASTM A1035.

Once the screws for the first rebar have been tightened down and heads twisted off, **insert the other** rebar into the coupler until it butts up **against the center stop** per Figure 4. In the **same order** as the first side, tighten the screws **down one row** until the heads twist off working from the end of the coupler toward the middle of the coupler. Then repeat the procedure down the second row, working from the end of the coupler toward the middle.

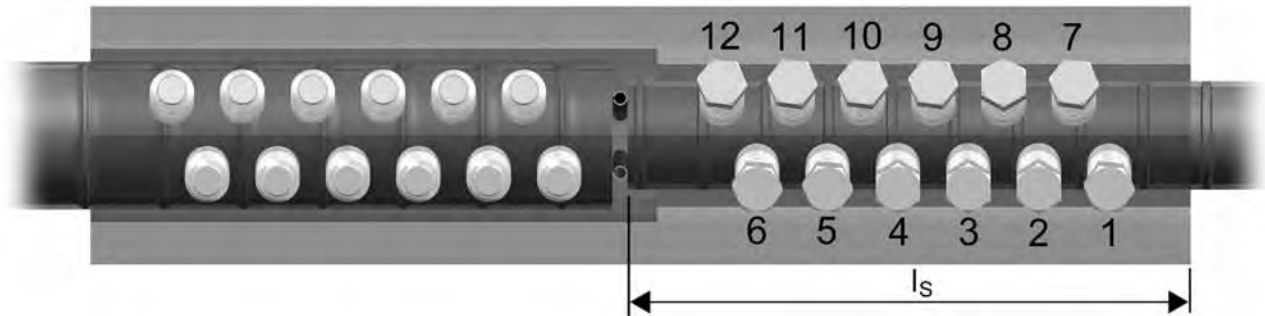


Figure 4. **Correct** Tightening Order, 2<sup>nd</sup> Side

● NOTE: Make sure to insert the larger rebar into the larger side of the transition coupler and the smaller rebar into the smaller side of the coupler. The larger side of the coupler requires “**I<sub>L</sub>**” rebar insertion which is less than the smaller side “**I<sub>S</sub>**” rebar insertion (see CHART 1 for rebar insertions).

OTHER THAN THE TRANSITION BAR SIZES SPECIFICALLY LABELED ON THE COUPLERS, DO NOT USE THIS PRODUCT IN CONJUNCTION WITH REBAR WHICH IS LARGER OR SMALLER THAN THE INTENDED BAR SIZE. CONTACT BPI FOR THE APPROPRIATE TRANSITION SPLICES. DO NOT SWITCH SCREWS BETWEEN THE LARGER AND SMALLER SIDES OF THE TRANSITION COUPLER. **KEEP COUPLERS CLEAN AND KEEP THREADS RUST FREE, PER FIGURE 5. STORE COUPLERS IN A CLEAN, DRY PLACE UNTIL READY TO INSTALL. RUST IN THE THREADS PRIOR TO ASSEMBLY, PER FIGURE 6, IS UNACCEPTABLE BECAUSE IT COULD RESULT IN LOWER PERFORMANCE OF THE ASSEMBLED SPLICE.**



Figure 5. Clean **Acceptable** Coupler



Figure 6. **Unacceptable** Rust in Coupler Threads

**CHART 1**

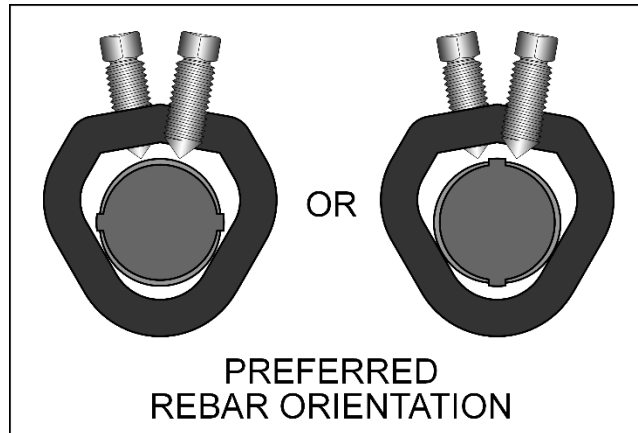
REBAR SIZE US [metric]	APPROXIMATE COUPLER LENGTH “L” (in.)	#14 REBAR INSERTION LENGTH (in.)	NUMBER OF SCREWS PER BAR	SOCKET SIZE “S”	AVERAGE SCREW TWIST-OFF TORQUE “T” (ft-lb)	MINIMUM IMPACT WRENCH TORQUE RATING (ft-lb)
* #14/10 [43/32]	13	6 3/8	6	3/4	350	1000
#14/11 [43/36]						
*#18/14 [57/43]	18 9/16	9 5/8	12	3/4	350	1000

\* REQUIRES LONGER LENGTH SCREWS ON THE SMALLER BAR SIDE OF TRANSITION COUPLER

▼ Example of suitable impact wrench is Ingersoll Rand, IR 290

## CAUTIONS AND SUGGESTIONS

1. For best installation and performance, try to adjust the orientation of the coupler or rebar so that the circular deformations of the rebar are in full bearing contact with the wedge shape of the coupler body, opposite of the screws. See below:



2. Follow the torque order described. Do not use any other torquing order.
3. For **best performance** and **ease of installation**, Barsplice recommends the use of a 1 inch drive pneumatic **impact wrench** ▼ and suitable socket. Make sure the impact wrench is rated to achieve at least the minimum impact wrench torque specified in **CHART 1** to avoid stalling. The **air supply** line should have a minimum diameter of **½ inch**. The air compressor should be large enough to provide **100 psi** (7 bar) gauge pressure & deliver 45 cfm of air flow.
4. **Do not use** an open-ended wrench or an adjustable wrench because of the risk of rounding-out the hexagon head prior to reaching the torque needed to twist off the head.
5. Prior to assembly, straighten excessively bent rebar ends so that proper wedge contact is made between rebar and coupler. **BAR ENDS** should be straight to within  $\frac{1}{8}$  inch in 18 inches. For curved rebar with a diameter that exceeds 54 feet, a bar end straightness check is not necessary. If needed, grind-off large shear lips that prevent proper insertion of rebar into coupler. **DO NOT USE THIS PRODUCT ON CURVED COLUMN REBAR ENDS.**
6. If removal of the center stop is necessary, use a hammer and punch or large nail to tap out the roll pins (2) in the coupling body.
7. Replace missing screws immediately with BPI special screws only. **DO NOT ALLOW THREADED HOLES TO RUST.**
8. If bars are corroded, removal of rust/corrosion must be performed to the same degree as that required to bond with concrete prior to installing the Zap coupler. Testing of old or severely corroded bars is recommended to ensure the integrity of the adjoining bars and compliance to design requirements. Performance statements of Zap couplers are based upon the use of ASTM **A615 / A706**, Grade 60 rebar.
9. **DO NOT ATTEMPT TO EPOXY COAT OR HOT-DIP GALVANIZE THIS PRODUCT IN ANY WAY. DO NOT ALLOW ABRASIVE BLAST MATERIAL TO COME INTO CONTACT WITH UNASSEMBLED THREADS.**
10. In all cases, consider your own **personal safety**. Make sure you are securely positioned and that you will not slip or fall during installation.

Please direct all assembly questions to BarSplice Products, Inc.