

INSTALLATION INSTRUCTIONS FOR No. 4 THROUGH 9 ZAP T-LOK HEADED DEVICES UNCOATED, EPOXY & GALVANIZED ON GRADE 60 REBAR [U.S. METRIC GRADE 420]

Determine which orientation (standard or reverse) the **No. 4 through 9 ZAP T-LOK** headed device needs to be installed on the rebar end. For ASTM A970 Class A configuration (9Ab), slide the T-lok onto the rebar end until the rebar reaches the **Minimum Class A Insertion Length** " I_A " per Figure 1 and Chart 1. For ASTM A970 Class HA configuration (14Ab), slide the T-lok onto the rebar end until the rebar reaches the **Minimum Class HA Insertion Length** " I_{HA} " per Figure 2 and Chart 1. Do not under-insert, as shown in Figures 3 or 4. For ease of installation, and inspection, the rebar can also be installed flush with the end of the T-lok, or even protruding slightly.

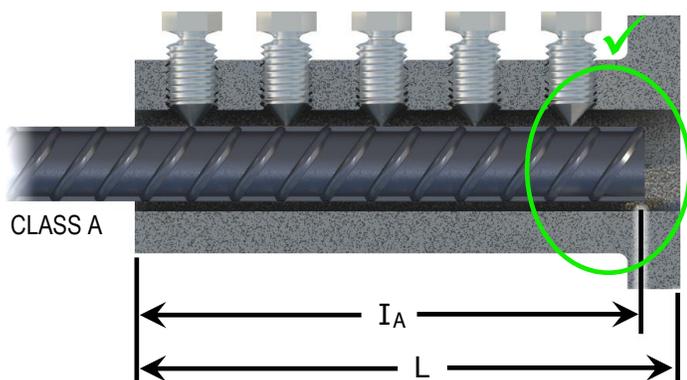


FIGURE 1: **Correct** Rebar Insertion Class A

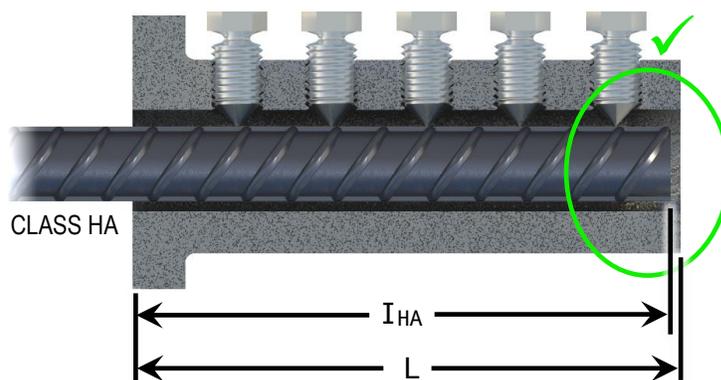


FIGURE 2: **Correct** Rebar Insertion Class HA

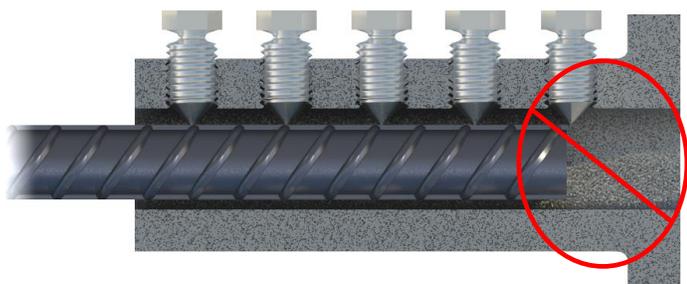


FIGURE 3: **Incorrect** Rebar Insertion Class A

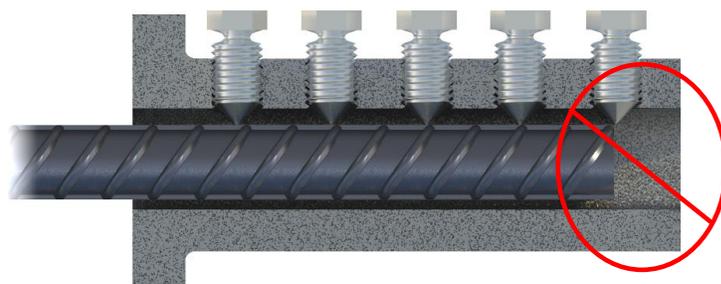


FIGURE 4: **Incorrect** Rebar Insertion Class HA

Using an **impact wrench** and a **socket "S"**, per Chart 1 on page 2, tighten the twist-off screws starting at the end furthest away from the bar end working your way **toward the end of the bar** *no matter the orientation of the T-Lok*. Tighten each screw until the head of the screw **twists off**. (See Chart 1 for approximate twist-off torque)

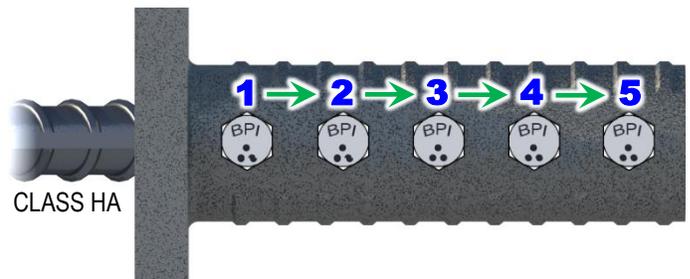
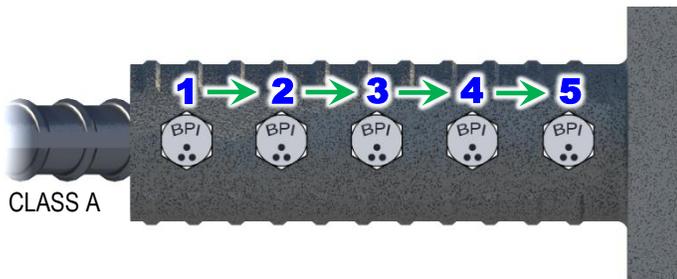


FIGURE 5: **Correct** Tightening Order Class A (#7 shown, other sizes similar)

FIGURE 6: **Correct** Tightening Order Class HA (#7 shown, other sizes similar)

DO NOT USE THESE HEADED DEVICES IN CONJUNCTION WITH REBAR WHICH IS LARGER OR SMALLER THAN THE INTENDED BAR SIZE. **KEEP HEADS CLEAN AND KEEP THREADS RUST FREE, PER FIGURE 7. STORE HEADS IN A CLEAN, DRY PLACE UNTIL READY TO INSTALL. RUST IN THE THREADS PRIOR TO ASSEMBLY, PER FIGURE 8, IS UNACCEPTABLE BECAUSE IT COULD RESULT IN LOWER PERFORMANCE OF THE ASSEMBLED HEADED DEVICE.**



FIGURE 7: Clean **Acceptable** Head



FIGURE 8: **Unacceptable** Rust in Threads

CHART 1

REBAR SIZE US [metric/CAN]	APPROX. T-LOK LENGTH "L" (in.)	MINIMUM INSERTION CLASS A "I _A " (in.)	MINIMUM INSERTION CLASS HA "I _{HA} " (in.)	NUMBER OF SCREWS PER HEAD	IMPACT SOCKET SIZE "S"	AVERAGE SCREW TWIST-OFF TORQUE "T" (ft-lb)	MINIMUM IMPACT WRENCH WORKING TORQUE (ft-lb)
#4 [12/10M]	5	4 ½	4 ⅞	4	½	60	250
#5 [16/15M]	5	4 ½	4 ⅞	4	½	60	250
#6 [20/20M]	6 ⅝	6	6 ½	4	⅝	105	500
#7 [22]	6 ⅝	6	6 ½	4	⅝	105	500
#8 [25/25M]	8 ⅜	7 ¼	8 ¼	5	¾	215	750
#9 [28/30M]	8 ⅜	7 ¼	8 ¼	5	¾	215	750

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

Please direct all assembly questions to BarSplice Products, Inc.

CAUTIONS AND SUGGESTIONS

1. In all cases, consider your own **personal safety**. Before beginning, make sure the equipment is functioning and in good working order. Ensure that you are securely positioned and that you will not slip or fall during installation.
2. Follow the torque order described. Do not use any other torquing order.
3. For **best performance** and **ease of installation**, use a high quality $\frac{3}{4}$ inch drive **pneumatic impact wrench** (▼such as Ingersoll Rand IR 261) and suitable impact socket. Make sure the impact wrench is rated to achieve at least the minimum impact wrench working torque specified in **CHART 1** to avoid stalling. The **air supply** hose and fittings should have a minimum inside diameter of $\frac{1}{2}$ inch. The towable air compressor should be large enough to provide **100 psi** (7 bar) gauge pressure & deliver a minimum air flow at load of **45 cfm**.
4. It is **NOT** recommended to use a battery powered or electric impact wrench of any size, make or model.
5. Each screw should normally take **4 – 8 seconds** for the head to twist-off. If each screw takes more than 10 seconds to twist-off, then there is either a restriction preventing enough air flow to reach the impact wrench, or the impact wrench is worn out/undersized and needs to be serviced/replaced. Examples of restrictions are the air line is too small, underrated air compressor, gauge pressure at air compressor set too low, hose fittings too small, underrated impact wrench, outside temperature too low for air compressor or impact wrench to function properly.
6. **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.
7. Prior to assembly, straighten excessively bent rebar ends so that proper wedge contact is made between rebar and device. 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 headed device.
8. Replace missing screws immediately with BPI special screws only. **DO NOT ALLOW THREADED HOLES TO RUST.**
9. If bars are corroded, removal of rust/corrosion on the bar ends must be performed to the same degree as that required to bond with concrete prior to installing the Zap T-lok. 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 T-lok headed devices are based upon the use of ASTM **A615 or A706** Grade 60 rebar.
10. For Epoxy Coated ASTM A775/A775M rebar or Galvanized ASTM A767 rebar, use a matching, pre-coated ZAP T-lok headed device. Touch-up coating damage and the sheared surfaces of screws with a suitable epoxy patching kit or zinc-rich cold galvanizing spray after assembly as required.
11. **DO NOT ATTEMPT TO EPOXY COAT OR HOT-DIP GALVANIZE AN UNCOATED ZAP PRODUCT IN ANY WAY. DO NOT ALLOW ABRASIVE BLAST MATERIAL TO COME INTO CONTACT WITH UNASSEMBLED THREADS.**

INSTALLATION INSTRUCTIONS FOR No. 10 THROUGH 14 ZAP T-LOK HEADED DEVICES UNCOATED, EPOXY & GALVANIZED ON GRADE 60 REBAR [U.S. METRIC GRADE 420]

Determine which orientation (standard or reverse) the **No. 10 through 18 ZAP T-LOK** headed device needs to be installed on the rebar end. For ASTM A970 Class A configuration (9Ab), slide the T-lok onto the rebar end until the rebar reaches the **Minimum Class A Insertion Length** " I_A " per Figure 1 and Chart 1. For ASTM A970 Class HA configuration (14Ab), slide the T-lok onto the rebar end until the rebar reaches the **Minimum Class HA Insertion Length** " I_{HA} " per Figure 2 and Chart 1. Do not under-insert, as shown in Figures 3 or 4. For ease of installation, and inspection, the rebar can also be installed flush with the end of the T-lok, or even protruding slightly.

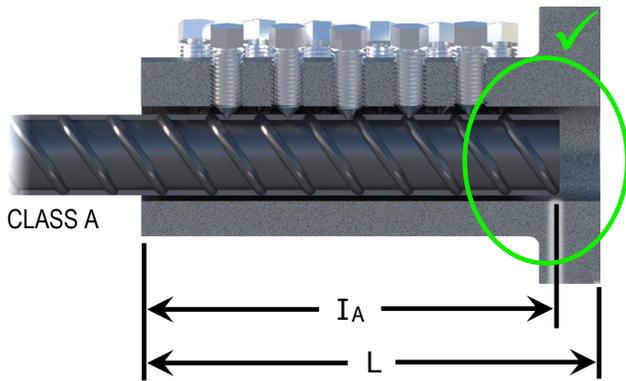


FIGURE 1: **Correct** Rebar Insertion Class A

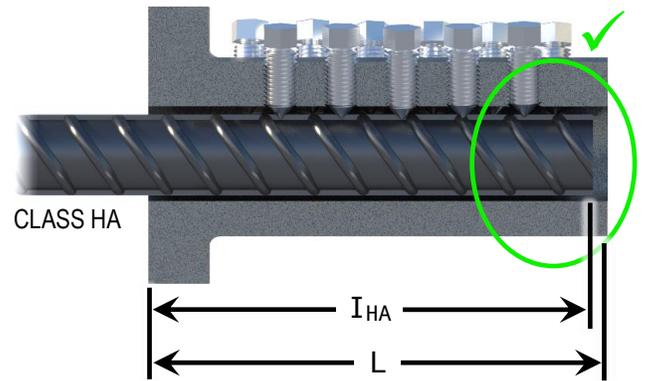


FIGURE 2: **Correct** Rebar Insertion Class HA

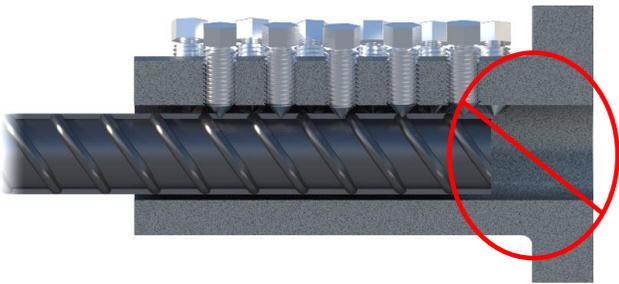


FIGURE 3: **Incorrect** Rebar Insertion Class A

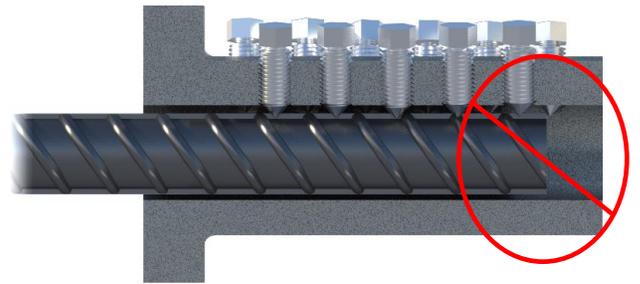


FIGURE 4: **Incorrect** Rebar Insertion Class HA

Using an **impact wrench** and a **socket "S"**, per Chart 1 on page 2, tighten the twist-off screws starting at the end furthest away from the bar end working your way **down one row toward the end of the bar no matter the orientation of the T-lok**. Tighten each screw until the head of the screw **twists off**. Then repeat the procedure down the second row, working your way **toward the end of the bar**. (See Chart 1 for approximate twist-off torque)

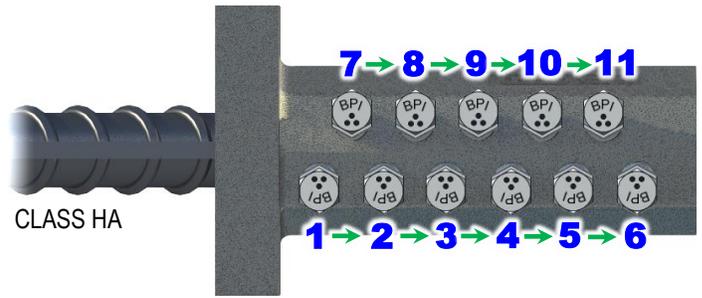
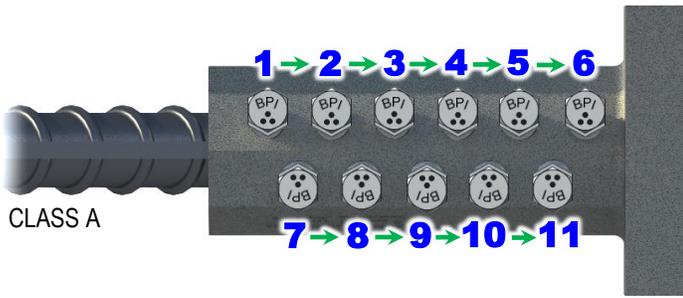


FIGURE 5: **Correct** Tightening Order Class A (#14 shown, other sizes similar)

FIGURE 6: **Correct** Tightening Order Class HA (#14 shown, other sizes similar)

DO NOT USE THESE HEADED DEVICES IN CONJUNCTION WITH REBAR WHICH IS LARGER OR SMALLER THAN THE INTENDED BAR SIZE. **KEEP HEADS CLEAN AND KEEP THREADS RUST FREE, PER FIGURE 7. STORE HEADS IN A CLEAN, DRY PLACE UNTIL READY TO INSTALL. RUST IN THE THREADS PRIOR TO ASSEMBLY, PER FIGURE 8, IS UNACCEPTABLE BECAUSE IT COULD RESULT IN LOWER PERFORMANCE OF THE ASSEMBLED HEADED DEVICE.**

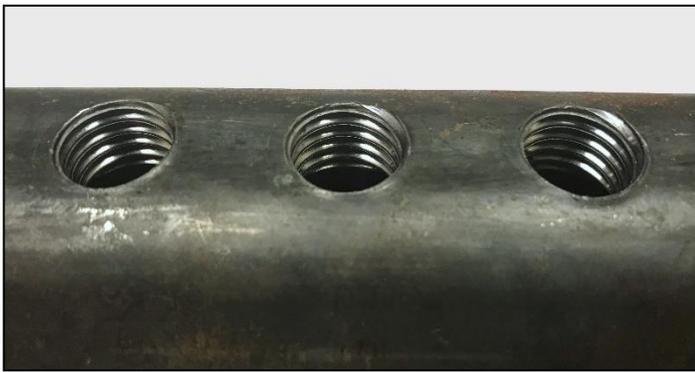


FIGURE 5: Clean **Acceptable** Coupler

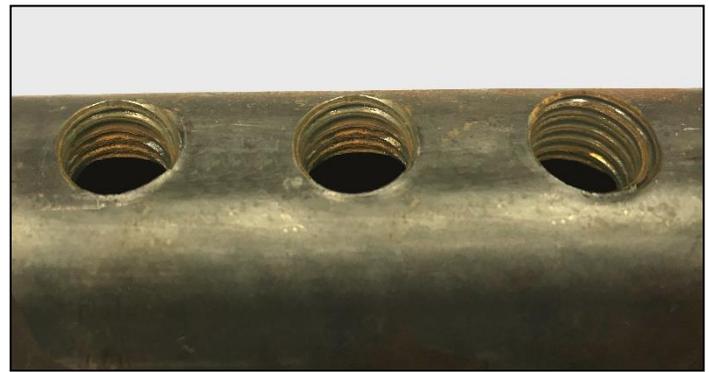


FIGURE 6: **Unacceptable** Rust in Coupler Threads

CHART 1

REBAR SIZE US [metric/CAN]	APPROX. T-LOK LENGTH "L" (in.)	MINIMUM INSERTION CLASS A "IA" (in.)	MINIMUM INSERTION CLASS HA "IHA" (in.)	NUMBER OF SCREWS PER HEAD	IMPACT SOCKET SIZE "S"	AVERAGE SCREW TWIST-OFF TORQUE "T" (ft-lb)	MINIMUM IMPACT WRENCH WORKING TORQUE (ft-lb)
#10 [32]	8 ½	7 ⅝	8 ⅜	9	¾	215	750
#11 [36/35M]	8 ½	7 ⅝	8 ⅜	9	¾	215	750
#14 [43/45M]	10 ½	9 ¼	10 ⅛	11	¾	350	1000

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

CAUTIONS AND SUGGESTIONS

1. In all cases, consider your own **personal safety**. Before beginning, make sure the equipment is functioning and in good working order. Ensure that you are securely positioned and that you will not slip or fall during installation.
2. Follow the torque order described. Do not use any other torquing order.
3. For **best performance** and **ease of installation**, use a high quality 1-inch drive **pneumatic impact wrench** (▼such as Ingersoll Rand IR 290) and suitable impact socket. Make sure the impact wrench is rated to achieve at least the minimum impact wrench working torque specified in **CHART 1** to avoid stalling. The **air supply** hose and fittings should have an inside diameter of **¾ inch or 1 inch**. The towable air compressor should be large enough to provide **100 psi (7 bar)** gauge pressure & deliver a minimum air flow at load of **60 cfm**.
4. It is **NOT** recommended to use a battery powered or electric impact wrench of any size, make or model.
5. Each screw should normally take **4 – 8 seconds** for the head to twist-off. If each screw takes more than 10 seconds to twist-off, then there is either a restriction preventing enough air flow to reach the impact wrench, or the impact wrench is worn out/undersized and needs to be serviced/replaced. Examples of restrictions are the air line is too small, underrated air compressor, gauge pressure at air compressor set too low, hose fittings too small, underrated impact wrench, outside temperature too low for air compressor or impact wrench to function properly.
6. **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.
7. Prior to assembly, straighten excessively bent rebar ends so that proper wedge contact is made between rebar and device. BAR ENDS should be straight to within ¼ 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 headed device.
8. Replace missing screws immediately with BPI special screws only. **DO NOT ALLOW THREADED HOLES TO RUST.**
9. If bars are corroded, removal of rust/corrosion on the bar ends must be performed to the same degree as that required to bond with concrete prior to installing the Zap T-lok. 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 T-lok headed devices are based upon the use of ASTM **A615 or A706** Grade 60 rebar.
10. For Epoxy Coated ASTM A775/A775M rebar or Galvanized ASTM A767 rebar, use a matching, pre-coated ZAP T-lok headed device. Touch-up coating damage and the sheared surfaces of screws with a suitable epoxy patching kit or zinc-rich cold galvanizing spray after assembly as required.
11. **DO NOT ATTEMPT TO EPOXY COAT OR HOT-DIP GALVANIZE AN UNCOATED ZAP PRODUCT IN ANY WAY. DO NOT ALLOW ABRASIVE BLAST MATERIAL TO COME INTO CONTACT WITH UNASSEMBLED THREADS.**