

INSTALLATION INSTRUCTIONS

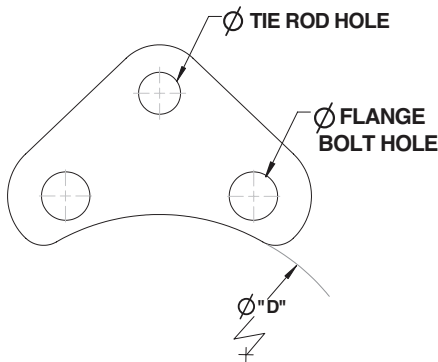
Read installation instructions first before installing. Check parts to ensure that no damage has occurred during transit and that no parts are missing. Also check the diameter of the pipe and the size marked on the Harness Lugs to ensure you have the proper size.

Style 490 Harness Lug

Step 1 • Check flange size and class for compatibility with 490 Harness Lug. Compatible flanges are: ANSI B16.1 CLS 125, ANSI B16.5 CLS 150, AWWA C207 CLS B, AWWA C207 CLS D, and AWWA C207 CLS E flanges.



CAUTION: Flanges with hub: The 490 harness lugs are designed with a radius to clear CLS D & CLS E hub flanges as well as most high hub ductile iron threaded flanges. Check to verify lug clearance over flange hub using “ØD” shown in the table below.)



Step 2 • Determine tie rod requirements per the table below. Tie rod quantities listed are for alloy steel (A193 GR B7), 304 SS (A193 GR B7) or 316 SS (A193 GR B8M).

| FLANGE SIZE | REQUIRED TIE ROD QUANTITY, MAXIMUM PRESSURE | | | | | TIE ROD SIZE (UNC) | LUG THICKNESS | LUG DIAMETER (FOR CLEARANCE) ØD |
|-------------|---|---------|---------|---------|---------|--------------------|---------------|---------------------------------|
| | 50 PSI | 100 PSI | 150 PSI | 200 PSI | 275 PSI | | | |
| 3 | 2 | 2 | 2 | 2 | 2 | 5/8 | 0.50 | Ø4.80 |
| 4 | 2 | 2 | 2 | 2 | 2 | 5/8 | 0.50 | Ø6.38 |
| 6 | 2 | 2 | 2 | 2 | 2 | 5/8 | 0.75 | Ø8.16 |
| 8 | 2 | 2 | 2 | 3 | 3 | 5/8 | 0.75 | Ø10.38 |
| 10 | 2 | 2 | 2 | 3 | 3 | 3/4 | 1.00 | Ø12.68 |
| 12 | 2 | 2 | 2 | 3 | 3 | 7/8 | 1.00 | Ø15.12 |
| 14 | 2 | 2 | 2 | 3 | 3 | 1 | 1.00 | Ø16.68 |
| 16 | 2 | 2 | 2 | 3 | 4 | 1 | 1.00 | Ø19.32 |
| 18 | 2 | 2 | 3 | 4 | 5 | 1 | 1.00 | Ø20.90 |
| 20 | 2 | 3 | 4 | 5 | 6 | 1 | 1.00 | Ø23.00 |
| 24 | 2 | 3 | 5 | 6 | 9 | 1 | 1.00 | Ø27.28 |
| 30 | 2 | 3 | 5 | 6 | 9 | 1 1/4 | 1.25 | Ø33.82 |
| 36 | 3 | 5 | 7 | 9 | 12 | 1 1/4 | 1.25 | Ø40.12 |
| 42 | 3 | 6 | 9 | 12 | 16 | 1 1/4 | 1.25 | Ø46.68 |
| 48 | 3 | 6 | 8 | 11 | 15 | 1 1/2 | 1.75 | Ø52.82 |
| 54 | 4 | 7 | 10 | 14 | 18 | 1 1/2 | 1.75 | Ø59.26 |
| 60 | 5 | 9 | 13 | 17 | 23 | 1 1/2 | 1.75 | Ø65.76 |
| 66 | 4 | 8 | 11 | 15 | 20 | 1 3/4 | 2.00 | Ø72.00 |
| 72 | 5 | 9 | 13 | 18 | 24 | 1 3/4 | 2.00 | Ø79.00 |

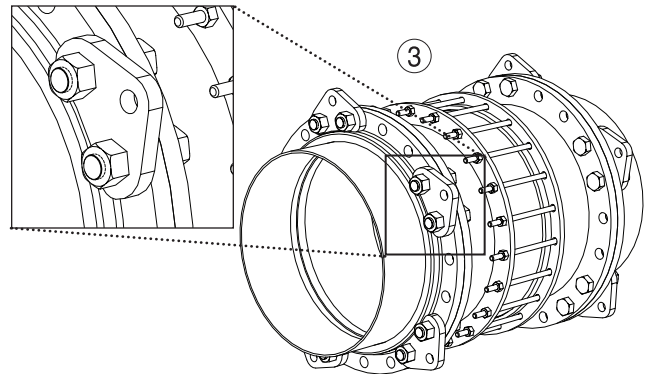
Step 3 • Install harness lugs behind the flanges to be restrained with equal spacing between each lug. If equal spacing is not an option, install harness lugs symmetrically.



CAUTION: Harness Lugs should be installed so that the tie rods are not at an angle.

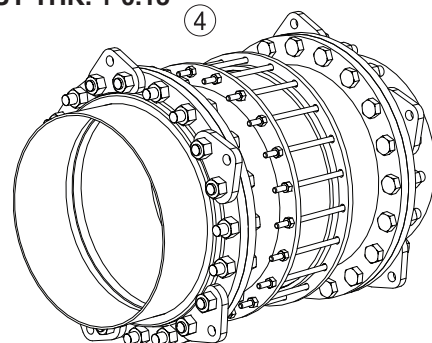
Use standard hex head flange bolts & nuts (not provided) with a minimum length per the formula shown below. Flange bolts & nuts should be Grade 5 or more. If stainless steel bolts are used, anti-galling lubricant should be applied to the threads.

Minimum harness lug bolt length = (2 x FLG THK) + HARNESS LUG THK + GASKET THK + NUT THK. + 0.13.



Step 4 • Install remaining flange bolts & nuts. Use standard hex head flange bolts and nuts with a minimum length per the formula shown below. Flange bolts and nuts should be grade 5 or more.

Minimum flange bolt length = 2 x FLG THK + GASKET THK + NUT THK. + 0.13



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Step 5 • Evenly tighten the bolts around the flange by diametrically alternating opposite positions at approximately 25 ft-lb increments until the recommended torque shown in the table below is achieved.

Wait ten minutes and then re-torque.

| FLANGE BOLT TORQUE RECOMMENDATION | | |
|-----------------------------------|-----------|-----------------|
| Flange Size | Bolt Size | Torque (ft-lbs) |
| 4 | 5/8" | 60 |
| 6-8 | 3/4" | 100 |
| 10-12 | 7/8" | 160 |
| 14-16 | 1 " | 245 |
| 18-20 | 1 1/8" | 355 |
| 24-30 | 1 1/4" | 500 |
| 36-48 | 1 1/2" | 875 |
| 54-72 | 1 3/4" | 1380 |

Step 6 • Install rods and nuts. Hand-tighten nuts, then firmly tighten jam nut. Do not allow the nut against harness lug to further tighten. Loctite may be used on nuts to ensure they stay in place.

