

WOODCO USA

Phone: 713-672-9491 USA and Canada: 1-800-496-6326 Fax: 713-672-8768
 www.woodcousa.com Email: sales@woodcousa.com

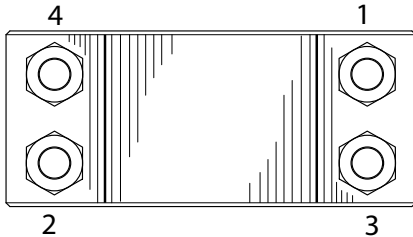
Instructions for Assembly and Make-up of API Clamp Hub Equipment

You may install a WOODCO USA clamp in any orientation desired. Prior to installation of the clamp, clean and lubricate the tapered contact surfaces of the hubs and the clamp with extreme pressure grease. Fluoropolymer coated bolts and nuts do not require lubrication.

Keep clamp halves matched and turned so that all marking appears on the same side of the clamp.

Install Fluoropolymer coated bolts, nuts and spherical load bearing washers, arranged as shown in the illustration below.

After all nuts have been run down by hand, start wrench tightening following the sequence of the numbers indicated (marking the number on the Clamp with a crayon aids in keeping track of the tightening process).



Because of the nature of the fit between Clamps and Hubs, a considerable number of nut turns may occur before achieving a significant percentage of recommended torque.

During all of the following steps, keep the gap between Clamp halves even on both sides, with nuts made up approximately the same amount on each end of the bolt.

- First time around just snug the nuts with a hand wrench.
- Continue tightening the nuts, closing the Clamp around the Hub evenly, until the space between the Hub neck and Clamp bore becomes nearly equal.
- Continue tightening to achieve approximately 25% recommended torque.

- Tighten another round to approximately 50% of recommended torque.
- Again to approximately 75% of recommended torque.
- Again to approximately 100% of recommended torque.
- Repeat this process until nuts do not move under 100% recommended torque.
- If possible, re-torque after 24 hours. Most of any bolt preload loss occurs within 24 hours after first tightening.

Confirm make up on hubs with SR and BX ring grooves by observing, through the gaps, that the hub faces have come into contact. After make up, clearance between the hub neck O.D. and the clamp I.D. should appear uniform.

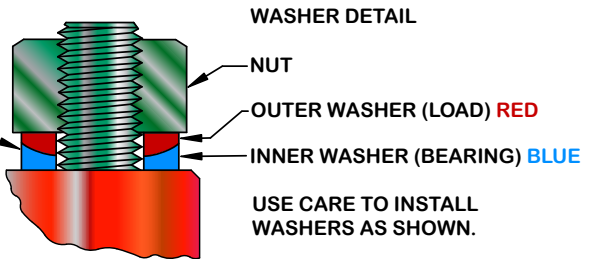
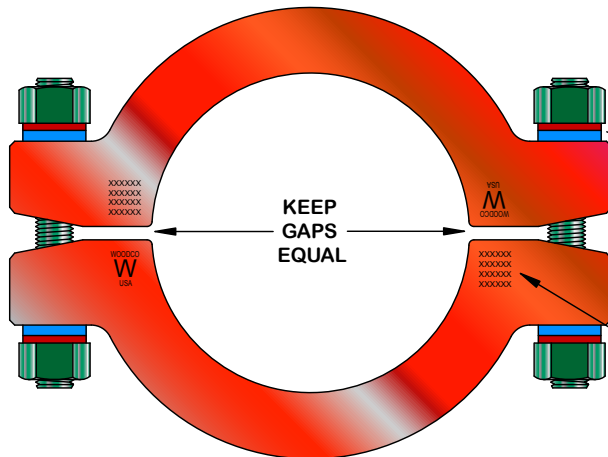
Excessive torque to achieve make up indicates some problem with fit or finish (rust on clamp or hub mating surfaces can result in difficulty during make up).

Protect the mating surfaces of hub connections and clamps in the same manner as ring grooves when not in use. Clamps or clamp hubs, if allowed to rust, lose their dimensional accuracy and finish and may become unusable.

Recommended Bolt Torque for WOODCO USA Hub Clamps

CLAMP NUMBER	BOLT SIZE	FLUOROPOLYMER COATED B7/L7 BOLTS*	
		FT-LBS	N · m
1, 2, 25	7/8" - 9UNC	185	251
3, 4, 5	1" - 8UNC	280	380
6	1-1/8" - 8UN	400	542
7, 9, 11, 12	1-3/8" - 8UN	735	997
8	1-1/2" - 8UN	960	1,302
14, 16, 20	1-5/8" - 8UN	1,225	1,661
10	1-7/8" - 8UN	1,890	2,562
13, 17, 18, 22	2-1/4" - 8UN	3,270	4,434
15, 19	2-1/2" - 8UN	4,500	6,101
28	3" - 8UN*	7,780	10,548
27	3-1/4" - 8UN*	9,900	13,423
26	4" - 8UN*	18,475	25,049

* WOODCO USA assembles API 16A Clamps with L7 Bolts only. Torque values for Bolts over 2-1/2" apply to L7 Bolts only.



INSTALL CLAMP HALVES SO MARKING ON BOTH HALVES APPEAR ON THE SAME SIDE OF THE CLAMP.

WOODCO USA

Phone: 713-672-9491 USA and Canada: 1-800-496-6326 Fax: 713-672-8768
www.woodcousa.com Email: sales@woodcousa.com

Inspection and Storage of API Clamp Hub Equipment

Clamps

Inspection requires a thorough cleaning, removing all dirt, paint, rust, etc.

Inspection should include particular care to positively identify clamp halves, matching them as to manufacturer and individual serial number (WOODCO USA uniquely identifies each assembly with a manufacturing work order number followed by the item manufacturing sequence number e.g. WO 12345-01 on each half).

Perform a visual inspection for obvious handling damage, corrosion, cracks, and galls. The 25° ramp inside the clamp should not have gouges, or deep pits. It should feel smooth to the touch (after cleaning). Clamps that do not appear damaged do not require dimensional inspection.

Caution: If circumstances should require dimensional inspection, keep in mind that API publishes no specific dimensions for clamps, but supplies only design requirements with allowable stress levels. Clamps made by different manufacturers will not likely have identical critical dimensions. Measurement of these critical dimensions requires special tools and skills and only knowledgeable persons qualified to perform dimensional inspections on clamps should do so. Measuring clamp dimensions and comparing one manufacturer's dimensions to those of another manufacturer will lead to false reports of non-conformance.

Evaluate bolts and nuts to the same criteria as used for flange bolting, and replace these parts if questionable. Replace any missing or damaged spherical washers.

Operators should store assembled, matched, clamp sets providing adequate protection from corrosion until next use.

Persons making any assembly of pressure control equipment should conduct a Pressure Test of the assembly, with a hold period before use.

Persons wishing to test loose Clamps to qualify them for later use on any Hub they will fit, should test them using Hubs that apply the highest load at test pressure. For a table of Clamps with test pressures on-line, go to www.woodcousa.com/clamp_load_main.htm.

Hub Connected Equipment

API 16A Hubs have ring grooves similar to, or exactly the same as, those ring grooves in API 6A flanges. Evaluating ring grooves in both Hubs and flanges involve the same practices. For an online guide to Appraisal of Ring Grooves, go to www.woodcousa.com/field_appr.htm.

Caution: API 16A Hub connections differ from flanges in that the ring groove, face, Hub O.D., and Hub edge width, all must conform to the exact API specified dimensions and tolerances in order to seal and function reliably. Field measurements on all of these dimensions require special tools and skills, only knowledgeable persons qualified to perform dimensional inspection on Hub connections should do so.

Hub ring grooves cannot have repair performed by skim cutting the Hub face and deepening the groove. Any groove rework beyond polishing must include weld repair to the Hub to provide stock for repair machining. If operators expect to connect and disconnect Hub connection equipment and store the equipment for any extended time, the operator would do well to specify corrosion resistant material inlay in the ring grooves at the time of original order.

If circumstances require weld repair to existing used Hub connected equipment, operators should consider adding corrosion resistant material inlay to the existing Hubs at the time of repair.

Beyond the ring grooves, API 16A specified Hubs should appear free of corrosion and pitting on the 25° backface ramps where Clamps must contact and slide to pull the connections together. The backface ramp should feel smooth to the touch (after cleaning).

Storage of Hub connected equipment should include protection of the entire Hub area from corrosion and handling damage.

Persons making any assembly of pressure control equipment should conduct a Pressure Test of the assembly, with a hold period before use.

Persons wishing to test assembled equipment, with or without internal closure mechanisms, should make their test consistent with the normative practices as shown in API Specs 6A and 16A.