

## DISASSEMBLY PROCEDURE

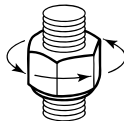
### 1 De-Pressurize the line

Always check, never take it for granted that the line has been de-pressurized. Proceed with caution since pressurization can re-occur for many reasons.



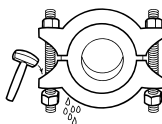
### 2 Slacken nuts but DO NOT remove the nuts from the bolts - then slacken clamp segments

Gradually undo the nuts until just loose. If clamp segments remain bound onto hubs, then BOTH segments must be slackened by hitting the inner face of the clamp lugs with a suitable soft-faced hammer.



### 3 Repeat slackening procedure

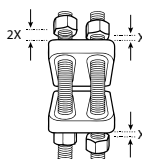
Further loosen nuts and re-slacken BOTH clamp segments until the maximum nut travel (2x) shown below is reached (ref. Table 2). This should release sealing contact and any residual pressure will then be released through the joint. DO NOT remove nuts.



### 4 Check clamps are slack and free to rotate and/or rock about hubs

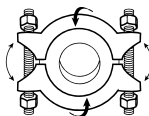
Do not proceed until any discharge ceases ensure that hubs are apart, sealing is free to move AND clamps are slack, free to rotate or rock. NOTE - If pressure is still in the line, the sealing might remain seated, making the joint tight even though it is part disassembled. ONLY when all components are loose and clamps are free to move can disassembly be completed. If the components are not free to move DO NOT CONTINUE - contact your supervisor.

X = Nut travel at end of bolt  
2X = Total nut travel from assembled position



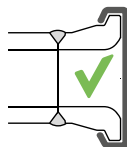
### 5 Always ask yourself - "What if ... ?"

- What if, the connection is still under pressure, am I or others in danger, and if so how?
- What if, there is still gas or fluid in the line?
- What if, the sling snaps or the load swings in my direction?
- What if, the piping springs upon release? (Piping spring may also prevent free rotation of clamps around the hubs).



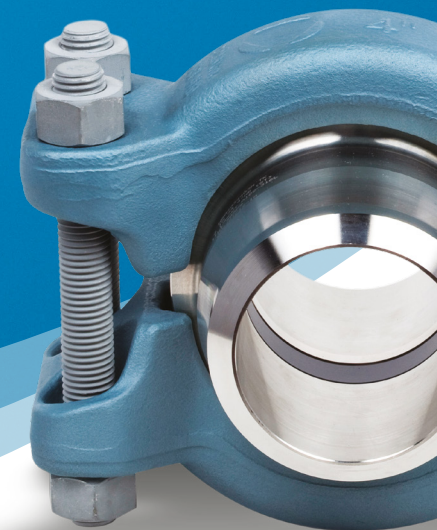
### 6 Protect parts for re-assembly

- Apply anti-corrosion coating to hub seat area.
- Fit protective caps.
- If sealing is to be re-used, inspect seal surfaces. If OK store safely for re-use; damaged sealings shall be discarded.



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VECTOR TECHLOK® CLAMP CONNECTOR **EN**



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## ASSEMBLY - DISASSEMBLY POCKET GUIDE

**VECTOR**  
Techlok® clamp connector

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## ASSEMBLY PROCEDURE

### 1 Inspect components prior to assembly

Hub and sealing tapered seating surfaces **MUST** be clean and free from foreign matter. Damaged or corroded seats must be rectified. Damaged sealings **MUST** be discarded . and replaced with new ones.

### 2 Verify sealing material

The correct size and material type of sealing **MUST** be fitted (see Table 1). Sealing material is marked on rib (as shown). Colour coding **DOES NOT APPLY** !

### 3 Lubricate

Usually sealings are coated which acts as lubricant during makeup. If required light oil or MoS2 spray can be used on hub sealing surface but not on sealing. Take care that no solid particles are present in the lubricant.

### 4 Check sealing standoff

The sealing should rock slightly against hub face. Tilt the sealing in the seat and measure stand-off gap (as shown). Stand-off dimensions given in Table 3.

### 5 Align Hubs

Hubs should be aligned so that sealing can be installed between hubs. **DO NOT** attempt to correct badly mis-aligned piping by clamping force alone; **piping pulling forces should only be released when clamp is fully assembled.**

### 6 Assemble components

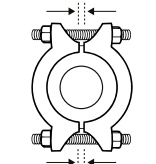
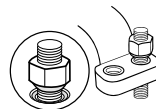
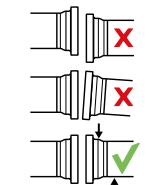
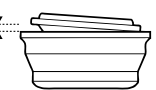
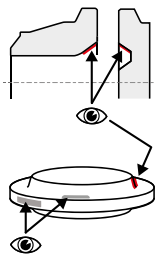
Install sealing into the hubs, and assemble clamps around the hubs. Lubricant applied to the hub/clamp contact area will aid assembly. The stud-bolts should be fitted ensuring that **spherically faced nuts** locate into **spherical seats** of the clamps. Lubrication with MoS2 (or similar) of nut faces and bolt threads is recommended (Table 2).

### 7 Tighten bolts in uniform manner

Bolting should be uniformly tightened to torque values shown in Table 2, keeping spacing between clamp halves approximately equal. Clamps may be positioned vertically (as shown) to prevent moisture collecting within the assembly.

### 8 Completed assembly

Complete Vector Techlok® assembly requires two conditions :  
1) Hubs must be completely face to face with the rib of the sealing where standard hubs are used and completely face to face with each other where recessed hubs are used.  
2) Bolts are made up to the correct torque.



## FABRICATION - "Attention to Detail"

### 1 Ensure good alignment - easy assembly

**IMPORTANT** - During fabrication, fully tighten connectors (face to face) for each section of pipework. **DO NOT** leave connectors loose for "final assembly" - otherwise sealing stand-off will introduce piping mis-alignment. When cutting pipe, allow for sealing rib thickness as shown (not applicable for recessed hubs). If in doubt, assemble components to verify.

### 2 Respect & protect sealing surfaces

- AVOID DAMAGE to seats from chains, weld spatter, earth clamps, inserting / removing equipment through bore, etc.
- Polish seats after heat treatment (180 Grit paper)
- Apply anti-corrosion protection where necessary and re-fit caps.

### 3 Corrosion protection

Vector Techlok® clamps and bolts are supplied with various protective coatings. Additional corrosion protection may be required on assembled connectors to suit environmental conditions and/or to rectify coating damage during assembly.

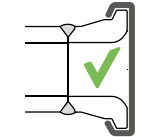
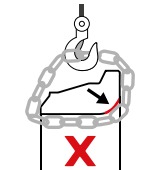
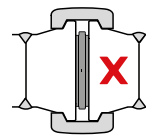


TABLE 3 : SEALING STANDOFF

Sealing Size	Minimum Standoff 'Tilted' for re-use		Sealing Size	Minimum Standoff 'Tilted' for re-use		Sealing Size	Minimum Standoff 'Tilted' for re-use	
	ins	mm		ins	mm		ins	mm
4	0.007	0.18	56	0.025	0.63	122	0.071	1.80
5	0.007	0.18	62	0.035	0.89	124	0.073	1.84
7	0.009	0.22	64	0.037	0.95	130	0.075	1.91
11	0.011	0.27	67	0.039	1.00	134	0.078	1.98
13	0.011	0.27	72	0.042	1.07	137	0.080	2.03
14	0.010	0.25	76	0.045	1.14	140	0.081	2.05
16	0.010	0.26	82	0.048	1.21	144	0.083	2.12
20	0.010	0.26	84	0.049	1.24	152	0.088	2.23
23	0.011	0.28	87	0.052	1.32	160	0.092	2.33
25	0.013	0.32	91	0.053	1.35	170	0.097	2.48
27	0.014	0.35	92	0.054	1.37	180	0.096	2.44
31	0.014	0.36	94	0.055	1.41	185	0.107	2.72
34	0.017	0.42	97	0.058	1.46	192	0.110	2.80
40	0.018	0.45	102	0.060	1.51	200	0.114	2.90
42	0.019	0.48	106	0.062	1.59	210	0.103	2.61
46	0.023	0.59	112	0.065	1.66	220	0.115	2.92
52	0.023	0.58	116	0.068	1.73	225	0.116	2.95
54	0.024	0.61	120	0.069	1.76	232	0.137	3.48

TABLE 1 : SEALING MATERIAL GUIDELINES

( recommendations only, does not over-rule client specifications )

Sealing Material Type		Low Alloy	Stainless	6Mo Stainless	High Strength Stainless	Duplex & Superduplex	Nickel Alloy
Grade marked on sealing rib		AISI 4130 AISI 4140	A182 F316	A182 F44	A564 630 (17/4 PH)	A182 F51 A182 F55	Alloy 718, 625 X 75 0
HUB MATERIAL	MARKING DATA (Material Grade)						
Carbon / Low alloy steel	A694 F52, F60, F65, A350 LF2	●	● (6)	● (6)	● (2)	● (6)	● (6)
	as above + Alloy 625 inlay	●	●	● (6)	●	● (6)	●
Stainless Steel	A182 F316, F304, F321	●	●	●	●	● (5)	●
	A182 F44 (6Mo)	●	● (1)	●	● (2,3,4)	● (5)	●
Duplex + S.Duplex	A182 F51, F53, F55, F61	●	● (1)	●	● (2,3)	●	●
Nickel Alloy	Alloy 625, 800,825, CS + Cladding	●	●	● (6)	●	●	●

Notes :

1. Corrosion resistance lower than Hub
2. Not recommended for sour service

3. Not recommended for produced or injected seawater

4. Not recommended for cryogenic service below -100°C

5. Not recommended for service below -50°C

6. For H<sub>2</sub>S service refer to NACE MR0175

TABLE 2 : TECHLOK BOLTING AND ASSEMBLY DATA

Clamp Size	Standard Bolt Dia	Bolt Preload Note 1	Bolt Torque (Friction=0.1) Notes 1 & 2	Notes	2X	GR Standard	GR Optional Sizes
	ins	Lbf	KN	Ft-lbs	Nm	ins	mm
STANDARD CLAMP SERIES							
1in	0.500	2,844	12.7	17	23	3 & 5	0.2
1 1/2 in	0.625	4,766	21.2	35	48	4 & 5	0.2
2in	0.750	6,516	29.0	55	75	4 & 5	0.2
3in	0.750	7,476	33.3	65	88	4 & 5	0.3
4in	0.875	9,946	44.2	100	136	4 & 5	0.4
5in	1.000	13,986	62.2	160	217	4 & 5	0.6
6in	1.125	16,032	71.3	210	285	4 & 5	1.0
8in	1.250	20,887	92.9	300	407	4 & 5	1.1
LIGHT DUTY SERIES							
L14in	1.625	39,727	177	700	949	3 & 5	1.3
L16in	1.750	42,084	187	800	1,085	3 & 5	1.3
L18in	1.875	54,288	241	1,100	1,492	3 & 5	1.3
L20in	2.000	58,073	258	1,250	1,695	3 & 5	1.3
L24in	2.250	74,880	333	1,800	2,440	3 & 5	1.6
HEAVY DUTY SERIES							
H2in	0.875	9946	44.2	100	136	4 & 5	0.2
H3in	0.875	11,931	53.1	120	163	4 & 5	0.3
H4in	1.000	12,240	54.4	140	190	4 & 5	0.4
H8in	1.375	25,599	114	390	529	4 & 5	0.9
H10in	1.625	39,722	177	700	949	4 & 5	1.2
H12in	1.750	47,340	211	900	1,220	4 & 5	1.5
H14in	1.875	59,208	263	1,200	1,627	4 & 5	1.5
H16in	2.250	83,204	370	2,000	2,711	4 & 5	1.6
H18in	2.250	83,204	370	2,000	2,711	4 & 5	1.7
H20in	2.250	89,448	398	2,150	2,915	4 & 5	1.7
H22in	2.250	89,448	398	2,150	2,915	4 & 5	1.7
H24in	2.250	93,608	416	2,250	3,051	4 & 5	1.8
H26in	2.500	103,590	461	2,750	3,728	4 & 5	1.8

Notes :

1. Basic (minimum) values shown shall be used for piping systems up to 600 lb, blind closures and applications using Stainless Steel clamps.
2. Different friction coefficients will require the torque values to be adjusted.
3. For 900 lb systems and above, increase bolt torque/preload by 1.5.
4. For 900 lb-1500 lb systems, increase bolt torque/preload by 1.5 ; for 2500 lb (incl. 5K) systems and above increase bolt torque/preload by 2.0.
5. Increased bolt torques/preload values in points 3 & 4 above apply for Low Alloy steel clamps with B7/B7M bolting (or equivalent). Do not use for Stainless Steel clamps.
6. Exceeding the bolt loads detailed above may cause clamp/hub distortions. If correct make-up is not achieved (i.e. unable to correct mis-alignment), then seek assistance as other measures may be needed to assist with the assembly.

COLOUR CODING

- STOP : Avoid this material selection !
- USE WITH CAUTION : Check specification or seek metallurgical advice (see notes)
- GO : Good material selection