AE4-1219 R8

BOLT TORQUE ON COPELAND COMPRESSORS

March, 2002

Maximum Torques in Inch Pounds With Lubricated Bolts
***S.A.E. Grade Identification on Back**

Bolt Usage	Size	Grade *	H, K	E,3A,3R,L	N	M,2,3D,9	4,6,8
Bottom Plate	5/16-18	8	300				
	3/8-16	5		400	400	400	400
	3/8-16	8		525	525	525	525
Capacity Control Valve	3/8-16					275	275
Cylinder Head	5/16-18	8	300				
	3/8-16	8		525	525	525	525
Two Center Bolts	5/16-18	8	225				
Cadmiuim Plated Head	5/16-18		250				
Two Center Bolts	5/16-18		200				
Crankcase Heater Plug	3/8 pipe					400	400
	1/2 pipe						450
Housing Cover	5/16-18	8	355				
	3/8-16	5		400	400	400	
	3/8-16	8					550
Oil Cooler Tee Fitting							120
Oil Pump or Bearing	1/4-20	5	100				
Cover to Housing Cover	5/16-18	5		250			
	5/16-18	8			300	300	300
Oil Shrader Fitting				180	180	180	
Oil Sight Cover Plate					145		
Oil Sight Glass	Retainer nuts		100	100			
	Bolts with	5			40	40	40
	'O' ring	8			75	75	75
Oil Supply Magnetic Plug	3/4 - 16					1200	
	1 - 16						1200
Stator Cover	5/16-18	8	375				
	3/8-16	5		400	400	400	
	3/8-16	8		525	525	525	
	1/2-13	5					625
Service Valves	5/16-18	5	225	225	225	225	
	1/2-13	5		500	500	500	500
	1/2-13	8					650
	5/8-11						950
Terminal Plate	5/16-18	8		300	300	300	
	3/8-16	8					525
Terminal Screws &	#10-32			35	35	35	
Nuts, Internal	1/4 - 28						50

Bolt Usage	Size	Grade *	H, K	E,3A,3R,L	N	M,2,3D,9	4,6,8
Terminal Screws & Nuts, External	#6-32		9	9	9	9	
	#8-32		18	18	18	18	
	#10-24						20
	#10-32		23	23	23	23	
	1/4 - 20						50
	1/4 - 28				50	50	
Terminal Jumper Bar Nut	1/4 - 28					80	
Terminal Fused Cluster	1/4 - 20				45	45	75
Terminal Block Screws	#10-32		23	23	23	23	
Terminal Cover	#8-18		40	40	40	40	

	Size	Torque
Flare Nuts (Double flared) copper or steel)	1/4	150
	5/16	220
	3/8	300
	1/2	400
	5/8	600
Pipe Plugs *	1/8	200
	1/4	300
	3/8	420
	1/2	480
	3/4	600
	1 **	700
Rotalock Couplings With Teflon Seal	3/4 - 16	360-480
	1 - 14	600-720
	1 1/4 - 12	960-1200
	1 1/2 - 12	1200-1440
	1 3/4 - 12	1440-1680
Sentronic Sensor		720-780

Condensing Units		
Fan Blade Mtg. Nut	1/4-20	42
Fan Blade Mtg. Screws	1/4-28	75
	5/16-24	155
Fan Guard Mtg. Screws	5/16-18	110
Receiver Mtg. Studs:		
Steel Bases	3/8-16	240
Noryl Plastic Bases	3/8-16	200

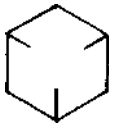
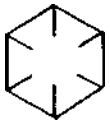
Under tension, metal parts will tend to stretch slightly, and gaskets may relax. Thus, it is quite probable after a period of time in which changes in temperature take place, that bolt torques will be somewhat reduced from the original setting. If oil or refrigerant leaks should occur, the bolts should be retightened to the original setting. **Retorquing of all bolts is recommended by Copeland! However, pipe plugs with sealant applied at the factory are not to be retorqued or seal broken, as this may create a leak path in the cured sealant.**

* Approved thread sealer: Loctite anaerobic PST # 12928/12929 Teflon sealer.

Apply sparingly to all threads only, Do not apply to end surface.

** Internal pressure relief valve: Use Loctite RC -620 to first two threads only.

General Torque Wrench Settings

	Size	Torque Grade 5	Torque Grade 8	Identification Grade 5	Identification Grade 8
Steel Bolts	1/4-20	100	135		
	5/16-18	250	300		
	3/8-16	400	525		
	1/2 - 13	450	1200		
	5/8 -11	950	2400		

VALVES

Pages 3 and 4 show different style valves, valve stem packing materials, proper procedures, and torque when activating service valves on Copeland compressors and condensing units. This should help to reduce the chance for leaks.

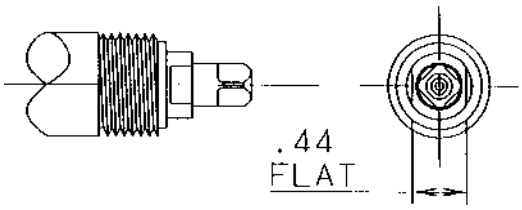


Figure 1

This style contains packing material. Before activating the valve stem, first loosen the brass gland nut (7/16" wrench). Front or back seat the valve stem, then re-torque the brass gland nut, per torques on page 4.

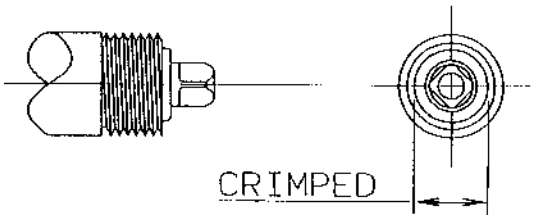


Figure 2

This style contains an 'O' ring seal without provision for gland adjustment. The end is crimped over.

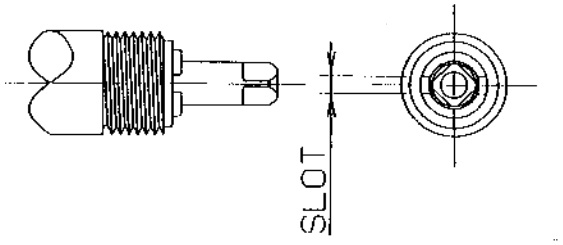


Figure 3

This style contains an 'O' ring seal with a gland nut. However, DO NOT loosen the gland nut. If the gland nut is loosened, the seal could be damaged and leak. If the 'O' ring does leak, it may be repaired by removing the gland nut with a special tool, picking out and carefully replacing the 'O' ring, do NOT force the 'O' ring, as force may shear the ring. Replace the gland nut using 96-120 inch pounds torque.

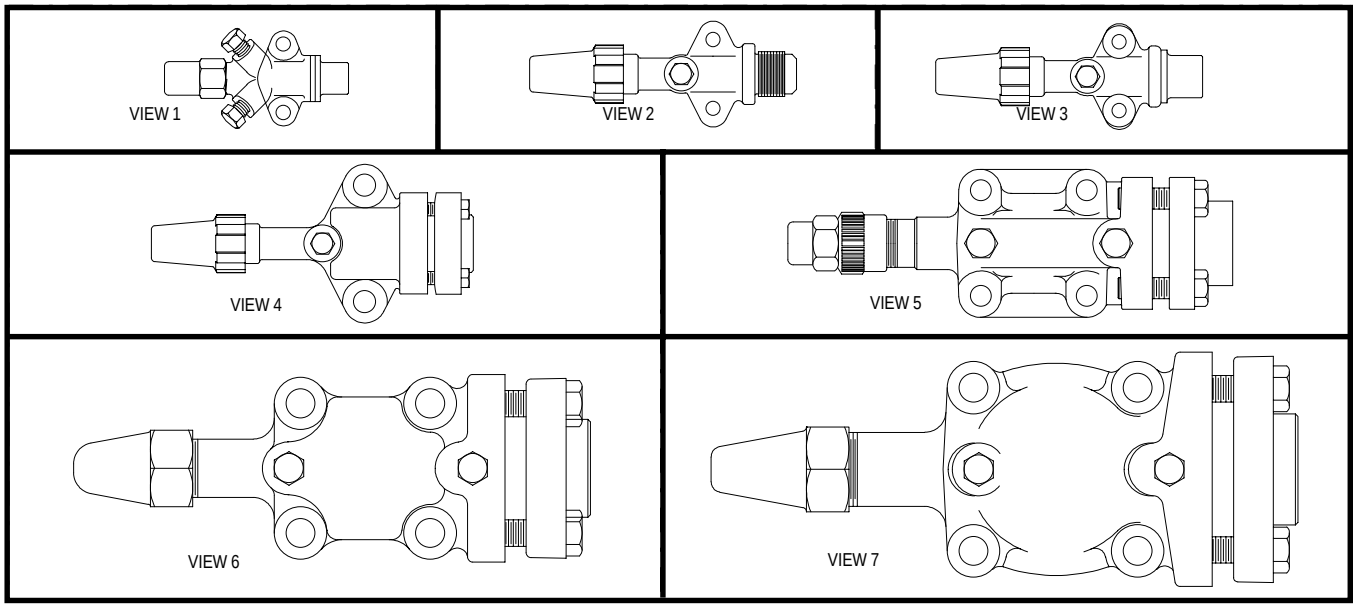


Figure 4

Table 1

Valve Body	Stem	Packing Gland
3/4 hex	42-60 (3-5)	72-96 (6-8)
7/8 square	72-90 (6-8)	72-96 (6-8)
1 1/8 square	132-150 (11-13)	72-96 (6-8)
1 3/8 square	180-210 (15-18)	180-240 (15-20)
1 7/8 square	240-270 (20-23)	264-324 (22-27)
View 1	144-216 (12-18)	144-240 (12-20)
View 2	144-216 (12-18)	144-240 (12-20)
View 3	360-480 (30-40)	180-300 (15-25)
View 4	360-480 (30-40)	180-300 (15-25)
View 5	360-600 (30-50)	300-420 (25-35)
View 6	360-600 (30-50)	360-480 (30-40)
View 7	480-840 (40-70)	480-840 (40-70)

All torques in inch pounds and (foot pounds)

Valve Stem Caps

To insure a leak free seal, all valve stem access caps must be employed, with sealing surfaces in good condition, and tightened to the following.

Plastic caps with rubber gasket: Hand tighten only.
Metal cap with rubber gasket: Hand tighten only.
Metal cap with copper gasket: 40-50 inch pounds

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