

Parts

Cyclo® BBB4 Reducer

Figure 31. Cyclo® BBB4 Reducer Parts

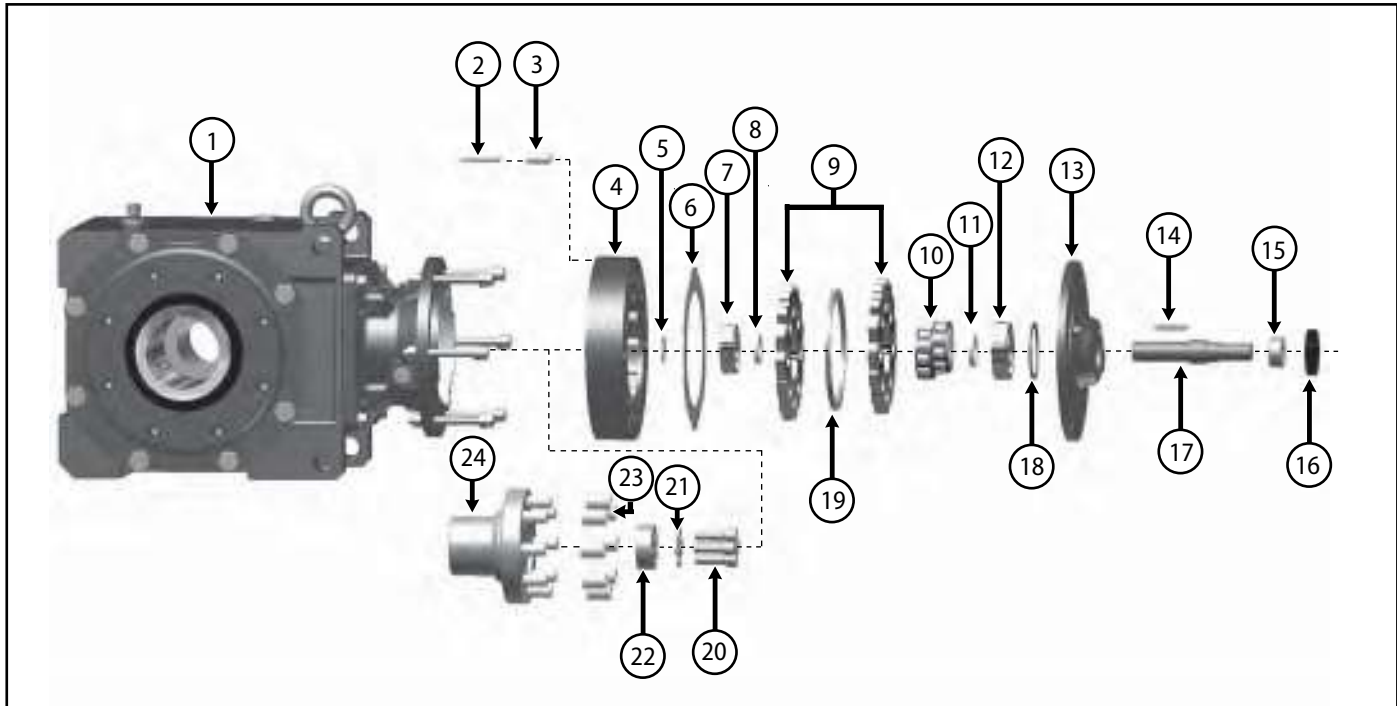


Table 31. Cyclo® BBB4 Reducer Parts

Number	Description
1	BBB4 Gear Assembly
2	Cyclo® Ring Gear Housing Pins
3	Cyclo® Ring Gear Housing Rollers
4	Cyclo® Ring Gear Housing
5	Snap Ring
6	Gasket Set
7	High Speed Shaft A Bearing
8	Spacer
9	Cycloid Discs
10	Cyclo® Eccentric Cam Assembly
11	Spacer
12	High Speed Shaft B Bearing

Number	Description
13	Cyclo® High-Speed End Shield
14	Eccentric Key
15	High Speed Shaft Oil Seal Collar
16	High Speed Shaft Oil Seal
17	High Speed Shaft
18	Snap Ring
19	Cycloid Disc Spacer
20	Retaining Bolts
21	Lock Washers
22	End Plate
23	Pin Carrier Rollers
24	Pin Carrier

Cyclo® Planetary Reduction Component Parts

Cyclo® Planetary Reduction Component Parts (Cyclo® Ratios 11 - 18:1)

Figure 32. Cyclo® Planetary Reduction Component

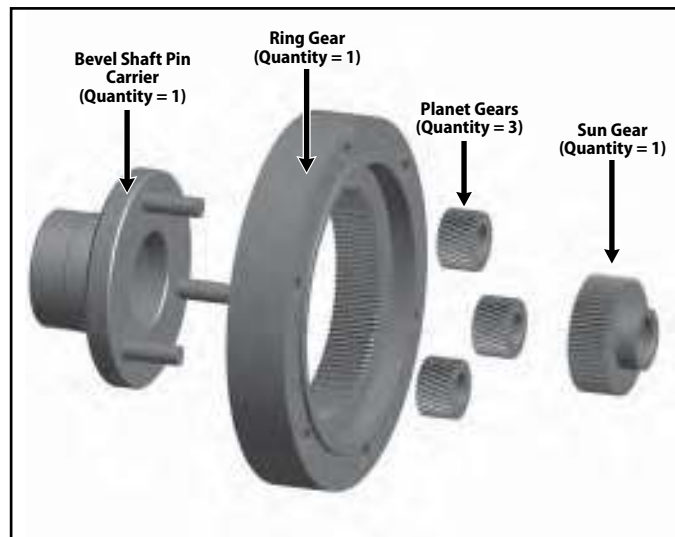


Table 32. Cyclo® Planetary Reduction Component Part Numbers (Ratios 11 - 18:1)

Unit Size	Reduction Ratio (nominal)		Cyclo® Planetary Reduction Part Numbers					
	Overall	Cyclo® Planetary	Reduction Block Set (gears & bearings)	Planet Gear	Ring Gear	Sun Gear	Unit Size	Bevel Shaft Pin Carrier
4A100 4A105	11	3	See Note ^[1]	AN8911G	AN8303G	AN8910G	4A100, 4A105	BL515LG
	13, 14	4	See Note ^[1]	AN8870G	AN8871G	AN8869G	4A120, 4A125	CJ701LG
	16, 18	5	See Note ^[1]	AN8305G	AN8306G	AN8304G	4B120, 4B125	CJ703LG
4A120, 4A125 4B120, 4B125	11	3	931BB612-003G	AN8308G	AN8309G	AN8307G	4A140, 4A145	CJ702LG
	13, 14	4	931BB612-004G	AP8706G	CJ554LG	AP8705G	4B140, 4B145	CJ704LG
	16, 18	5	931BB612-005G	AN8311G	AN8312G	AN8310G	4C140, 4C145	CJ706LG
4A140, 4A145 4B140, 4B145 4C140, 4C145	11	3	931BB614-003G	AP0884G	AP0885G	AP0883G	4B160, 4B165	CJ705LG
	13, 14	4	931BB614-004G	AP8708G	CJ555LG	AP8707G	4C160, 4C165	CJ707LG
	16, 18	5	931BB614-005G	AN8317G	AN8318G	AN8316G	4D160, 4D165	CH457LG
4B160, 4B165 4C160, 4C165 4D160, 4D165	11	3	931BB616-003G	AP0890G	AP0891G	AP0889G	4C170, 4C175	CJ938LG
	13, 14	4	931BB616-004G	AP8710G	CJ556LG	AP8709G	4D170, 4D175	CH738LG
	18	5	931BB616-005G	AN8323G	AN8324G	AN8322G	4E170, 4E175	CH738LG
4C170, 4C175 4D170, 4D175 4E170, 4E175	11	3	931BB617-003G	AN8913G	AN8914G	AN8912G	4D180, 4D185 4E180, 4E185 ^[2]	CJ961LG
	13, 14	4	931BB617-004G	AP9280G	CJ994LG	AP9279G		CJ960LG
	16, 18	5	931BB617-005G	AN8329G	AN8330G	AN8328G		CJ959LG
4D180, 4D185 4E180, 4E185 ^[2]	11	3	931BB618-003G	AP9285G	CJ997LG	AP9284G	4E190, 4E195	CJ962LG
	13, 14	4	931BB618-004G	AP9287G	CJ997LG	AP9286G		CJ963LG
	16, 18	5	931BB618-005G	AP9289G	CJ997LG	AP9288G		CJ964LG
4E190, 4E195 4F190, 4F195 ^[2]	11	3	931BB619-003G	AP9292G	CK004LG	AP9291G	4F190, 4F195 ^[2]	CJ968LG
	13, 14	4	931BB619-004G	AP9294G	CK004LG	AP9293G		CJ969LG
	16, 18	5	931BB619-005G	AP9296G	CK004LG	AP9295G		CJ970LG

Note: [1] Consult Factory
[2] 18:1 ONLY

Parts, continued

Cyclo® Reduction Component Parts

Cyclo® BBB4 Reduction Component Part Numbers (Ratios ≥ 19:1)

Figure 33. Cyclo® BBB4 Reduction Components - 4A100 thru 4F195

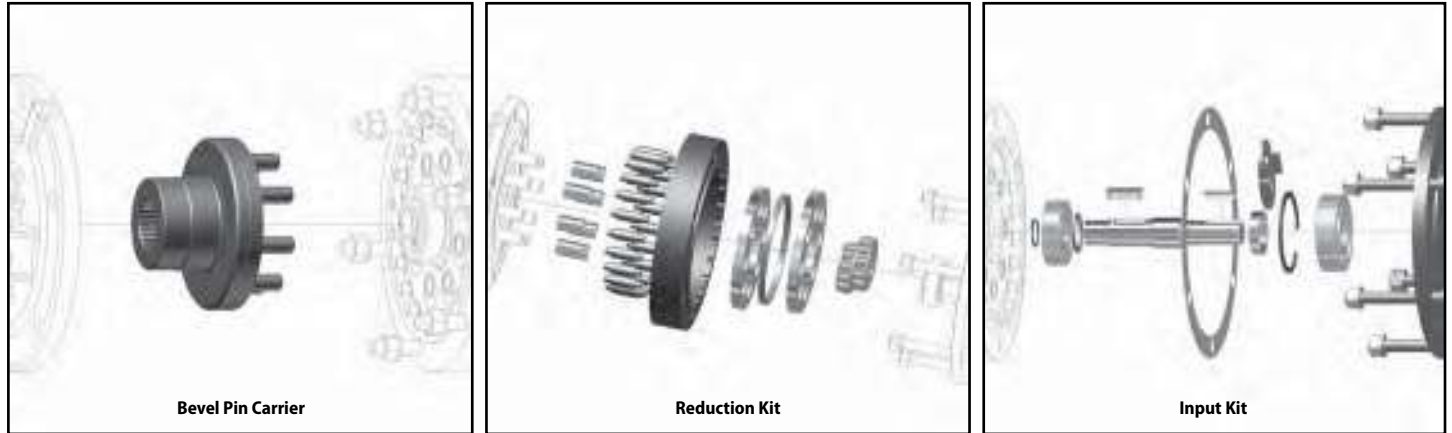


Table 33. Cyclo® BBB4 Reduction Component Part Numbers (Ratios ≥ 19:1)

Unit Size	Reduction Ratio		Part Numbers		
	Overall	Cyclo®	Input Kit	Reduction Kit	Bevel Pin Carrier
4A100 4A105	19, 21	6	D78622	D78675	BL514LG
	22, 25	7		See Note ⁽¹⁾	
	26, 28	8		D78676	
	35, 39	11		D78677	
	42, 46	13		D78678	
	48, 53	15		D78679	
	54, 60	17		D78680	
	67, 74	21		D78681	
	80, 88	25		D78682	
	93, 102	29		D78683	
	112, 123	35		D78684	
	138, 151	43		D78685	
	163, 179	51		D78686	
	189, 207	59		D78687	
	227, 249	71		D78688	
	278, 305	89		D78689	
	364	104		See Note ⁽¹⁾	
364, 417	119	See Note ⁽¹⁾			
≥ 424	≥ 121	See Note ⁽¹⁾			
4A110 4A115	19, 21	6	D78504	D78520	CJ690LG
	22, 25	7		See Note ⁽¹⁾	
	26, 28	8		D78521	
	35, 39	11		D78522	
	42, 46	13		D78523	
	48, 53	15		D78524	
	54, 60	17		D78525	
	67, 74	21		D78526	
	80, 88	25		D78527	
	93, 102	29		D78528	
	112, 123	35		D78529	
	138, 151	43		D78530	
	163, 179	51		D78531	
	189, 207	59		D78532	
	227, 249	71		D78533	
	278, 305	87		D78534	
	364	104		See Note ⁽¹⁾	
364, 417	119	See Note ⁽¹⁾			
≥ 424	≥ 121	See Note ⁽¹⁾			

Note: [1] Consult Factory

Cyclo® Reduction Component Parts

Table 33. Cyclo® BBB4 Reduction Components Part Numbers (Ratios >19:1), continued

Unit Size	Reduction Ratio		Part Numbers				Unit Size	Reduction Ratio		Part Numbers				
	Overall	Cyclo®	Input Kit	Reduction Kit	4A12	4B12		Overall	Cyclo®	Input Kit	Reduction Kit	4A14	4B14	4C14
					Bevel Pin Carrier	Bevel Pin Carrier						Bevel Pin Carrier	Bevel Pin Carrier	Bevel Pin Carrier
4A120	19, 21	6	D78623	D78690	CJ691LG	CJ693LG	4A140	19, 21	6	D78623	D78535	CJ692LG	CJ694LG	CJ696LG
	22, 25	7		See Note ⁽¹⁾				D78536						
	26, 28	8		D78691				D78537						
	35, 39	11		D78692				D78538						
	42, 46	13		D78693				D78539						
	48, 53	15		D78694				D78540						
	54, 60	17		D78695				D78541						
	67, 74	21		D78696				D78542						
	80, 88	25		D78697				D78543						
	93, 102	29		D78698				D78544						
	112, 123	35		D78699				D78545						
	138, 151	43		D78700				D78546						
	163, 179	51		D78701				D78547						
	189, 207	59		D78702				D78548						
	227, 249	71		D78703				D78549						
278, 305	89	D78704	See Note ⁽¹⁾											
364	104	See Note ⁽¹⁾	See Note ⁽¹⁾											
364, 417	119	See Note ⁽¹⁾	See Note ⁽¹⁾											
≥ 424	≥ 121	See Note ⁽¹⁾	See Note ⁽¹⁾											

Unit Size	Reduction Ratio		Part Numbers				Unit Size	Reduction Ratio		Part Numbers				
	Overall	Cyclo®	Input Kit	Reduction Kit	4B16	4C16		4D16	Overall	Cyclo®	Input Kit	Reduction Kit	4C17	4D17, 4E17
					Bevel Pin Carrier	Bevel Pin Carrier		Bevel Pin Carrier					Bevel Pin Carrier	Bevel Pin Carrier
4B160	19, 21	6	D78625	D78720	CJ695LG	CJ697LG	CJ699LG	4C170	19, 21	6	D78626	D78735	CJ698LG	CJ700LG
	22, 25	7		See Note ⁽¹⁾					D78736					
	26, 28	8		D78721					D78737					
	35, 39	11		D78722					D78738					
	42, 46	13		D78723					D78739					
	48, 53	15		D78724					D78740					
	54, 60	17		D78725					D78741					
	67, 74	21		D78726					D78742					
	80, 88	25		D78727					D78743					
	93, 102	29		D78728					D78744					
	112, 123	35		D78729					D78745					
	138, 151	43		D78730					D78746					
	163, 179	51		D78731					D78747					
	189, 207	59		D78732					D78748					
	227, 249	71		D78733					See Note ⁽¹⁾					
278, 305	89	D78734	See Note ⁽¹⁾											
364	104	See Note ⁽¹⁾	See Note ⁽¹⁾											
364, 417	119	See Note ⁽¹⁾	See Note ⁽¹⁾											
≥ 424	≥ 121	See Note ⁽¹⁾	See Note ⁽¹⁾											

Unit Size	Reduction Ratio		Part Numbers				Unit Size	Reduction Ratio		Part Numbers				
	Overall	Cyclo®	Input Kit	Reduction Kit	4D18	4E18		4F18	Overall	Cyclo®	Input Kit	Reduction Kit	4E19	4F19
					Bevel Pin Carrier	Bevel Pin Carrier		Bevel Pin Carrier					Bevel Pin Carrier	Bevel Pin Carrier
4D180	19, 21	6	D78627	See Note ⁽¹⁾	CK012LG	CK016LG	4E190	19, 21	6	D78628	See Note ⁽¹⁾	CJ956LG	CJ931LG	
	22, 25	7		See Note ⁽¹⁾				See Note ⁽¹⁾						
	26, 28	8		See Note ⁽¹⁾				D78763						
	35, 39	11		D78749				D78764						
	42, 46	13		D78750				D78765						
	48, 53	15		D78751				D78766						
	54, 60	17		D78752				D78767						
	67, 74	21		D78753				D78768						
	80, 88	25		D78754				D78769						
	93, 102	29		D78755				D78770						
	112, 123	35		D78756				D78771						
	138, 151	43		D78757				D78772						
	163, 179	51		D78758				D78773						
	189, 207	59		D78759				D78774						
	227, 249	71		D78760										
278, 305	87	D78761												

Unit Size	Reduction Ratio		Part Numbers				Unit Size	Reduction Ratio		Part Numbers				
	Overall	Cyclo®	Input Kit	Reduction Kit	4D18	4E18		4F18	Overall	Cyclo®	Input Kit	Reduction Kit	4E19	4F19
					Bevel Pin Carrier	Bevel Pin Carrier		Bevel Pin Carrier					Bevel Pin Carrier	Bevel Pin Carrier
4D180	19, 21	6	D78627	See Note ⁽¹⁾	CK012LG	CK016LG	4E190	19, 21	6	D78628	See Note ⁽¹⁾	CJ956LG	CJ931LG	
	22, 25	7		See Note ⁽¹⁾				See Note ⁽¹⁾						
	26, 28	8		See Note ⁽¹⁾				D78763						
	35, 39	11		D78749				D78764						
	42, 46	13		D78750				D78765						
	48, 53	15		D78751				D78766						
	54, 60	17		D78752				D78767						
	67, 74	21		D78753				D78768						
	80, 88	25		D78754				D78769						
	93, 102	29		D78755				D78770						
	112, 123	35		D78756				D78771						
	138, 151	43		D78757				D78772						
	163, 179	51		D78758				D78773						
	189, 207	59		D78759				D78774						
	227, 249	71		D78760										
278, 305	87	D78761												

Unit Size	Reduction Ratio		Part Numbers				Unit Size	Reduction Ratio		Part Numbers				
	Overall	Cyclo®	Input Kit	Reduction Kit	4D18	4E18		4F18	Overall	Cyclo®	Input Kit	Reduction Kit	4E19	4F19
					Bevel Pin Carrier	Bevel Pin Carrier		Bevel Pin Carrier					Bevel Pin Carrier	Bevel Pin Carrier
4D180	19, 21	6	D78627	See Note ⁽¹⁾	CK012LG	CK016LG	4E190	19, 21	6	D78628	See Note ⁽¹⁾	CJ956LG	CJ931LG	
	22, 25	7		See Note ⁽¹⁾				See Note ⁽¹⁾						
	26, 28	8		See Note ⁽¹⁾				D78763						
	35, 39	11		D78749				D78764						
	42, 46	13		D78750				D78765						
	48, 53	15		D78751				D78766						
	54, 60	17		D78752				D78767						
	67, 74	21		D78753				D78768						
	80, 88	25		D78754				D78769						
	93, 102	29		D78755				D78770						
	112, 123	35		D78756				D78771						
	138, 151	43		D78757				D78772						
	163, 179	51		D78758				D78773						
	189, 207	59		D78759				D78774						
	227, 249	71		D78760										
278, 305	87	D78761												

Note: [1] Consult Factory

Bearings and Oil Seals

Figure 34. Cyclo® BBB4 Bearings and Oil Seals

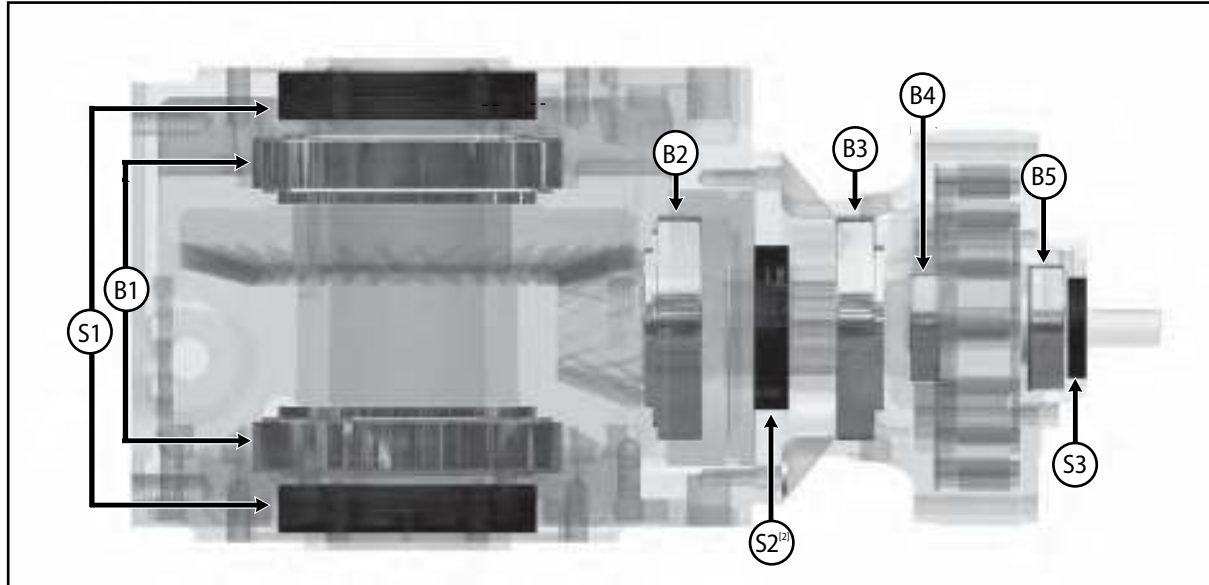


Table 34. Cyclo® BBB4 Reducer Bearings and Oil Seals

Unit Size	Bearings					Oil Seals ^[1]					
	B1	B2	B3	B4	B5	S1	S2 ^[2]	S3			
4A100 4A105 4A110 4A115 4A120 4A125	32017	32308	32011	6302RSH2	6302Z	D 85 x 110 x 13	S 50 x 68 x 9	S 20 x 35 x 7			
4A140 4A145			32013	6304	6305Z			D 32 x 52 x 8			
4B120 4B125			32020	32310	30215			6305R	6306	D 100 x 125 x 13	D 38 x 58 x 11
4B140 4B145					32013			6304	6305Z	S 60 x 75 x 9	D 32 x 52 x 8
4B160 4B165					30215			6305R	6306	D 38 x 58 x 11	
4C140 4C145					32024			32312	30217	6307R	6308
4C160 4C165	30215	6305R	6306	S 70 x 95 x 13		D 38 x 58 x 11					
4C170 4C175	30217	6307R	6308	D 62 x 82 x 12							
4D160 4D165	32028	32314	30217	6307R		6308	D 140 x 170 x 14		D 55 x 78 x 12		
4D170 4D175			30220	6406	6407	S 90 x 115 x 13	D 62 x 82 x 12				
4D180 4D185			30222	6407	6409	D 65 x 88 x 12					
4E170 4E175			32032	32315	30220	6406	6407	D 160 x 190 x 16	D 62 x 82 x 12		
4E180 4E185	30222	6407			6409	S 90 x 115 x 13	D 65 x 88 x 12				
4E190 4E195	30226	6408			6411	S 70 x 88 x 10					
4F180 4F185	32036	32319			30226	6407	6409	D 180 x 210 x 16	D 65 x 88 x 12		
4F190 4F195			30230	6408	6411	S 140 x 170 x 14	S 70 x 88 x 10				

Notes: [1] D = Double Lip Seal, S = Single Lip Seal. Seal Dimensions are in mm.
[2] for "Y4" assembly only.

Bevel Gearing Parts and Tooth Count

Bevel gear and pinions are sold in sets only. Individual components are not available for purchase. The information below regarding tooth count of the bevel gearset is provided for vibration analysis purposes.

Figure 35. Cyclo® BBB4 Bevel Gearing Tooth Count

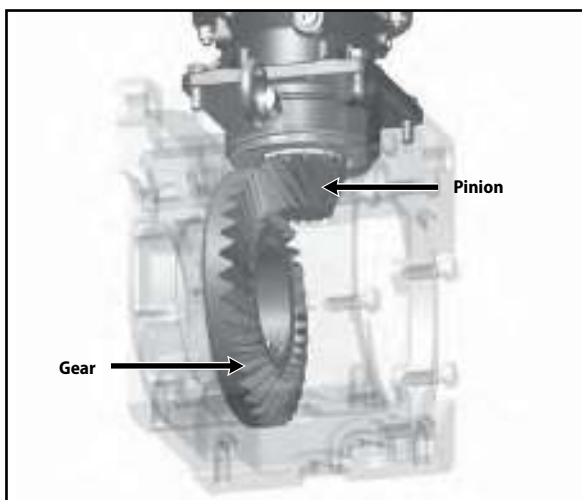


Table 35. Cyclo® BBB4 Ratios

Cyclo® BBB4 Nominal Ratio	Bevel Ratio	Cyclo® Input Ratio
11	3.5	3 ^[1]
13	3.2	4 ^[1]
14	3.5	4 ^[1]
16	3.2	5 ^[1]
18	3.5	5 ^[1]
19	3.2	6
21	3.5	6
22	3.2	7
25	3.5	7
26	3.2	8
28	3.5	8
35	3.2	11
39	3.5	11
42	3.2	13
46	3.5	13
48	3.2	15
53	3.5	15
54	3.2	17
60	3.5	17
67	3.2	21
74	3.5	21

Note: [1] Planetary Input

Cyclo® BBB4 Nominal Ratio	Bevel Ratio	Cyclo® Input Ratio
80	3.2	25
88	3.5	25
93	3.2	29
102	3.5	29
112	3.2	35
123	3.5	35
138	3.2	43
151	3.5	43
163	3.2	51
179	3.5	51
189	3.2	59
207	3.5	59
227	3.2	71
249	3.5	71
278	3.2	87
305	3.5	87
364	3.5	104
417	3.5	119
424	3.5	121
501	3.5	143
578	3.5	165
683	3.5	195

Cyclo® BBB4 Nominal Ratio	Bevel Ratio	Cyclo® Input Ratio
809	3.5	231
956	3.5	273
1117	3.5	319
1320	3.5	377
1656	3.5	473
1957	3.5	559
2272	3.5	649
2559	3.5	731
2944	3.5	841
3511	3.5	1003
4365	3.5	1247
5177	3.5	1479
6472	3.5	1849
7228	3.5	2065
8880	3.5	2537
10658	3.5	3045
12184	3.5	3481
15530	3.5	4437
17966	3.5	5133
21620	3.5	6177
26492	3.5	7569

To determine the bevel tooth count, identify the Cyclo® BBB4 nominal ratio and corresponding bevel ratio from Table 35. Then reference Table 36 to identify the actual number of bevel gear and pinion teeth.

Table 36. Bevel Tooth Count and Part Numbers

Bevel Ratio	Number of Teeth		Bevel Gear Set Part Number						
	Gear	Pinion	4A10, 4A11 4A12, 4A14	4B12, 4B14, 4B16	4C14, 4C16, 4C17	4D16	4D17, 4D18	4E17, 4E18, 4E19	4F18, 4F19
3.2	10	32	CJ570LG/CJ560LG	CJ561LG/CJ571LG	CJ562LG/CJ572LG	998BBB-4D16BG	998BBB-4D17BG	998BBB-4E--BG	998BBB-4F--BG
3.5	10	35	998BBB-2A---G	998BBB-2B---G	998BBB-2C---G	998BBB-2D---G	998BBB-2D17-G	998BBB-2E---G	998BBB-4F--AG