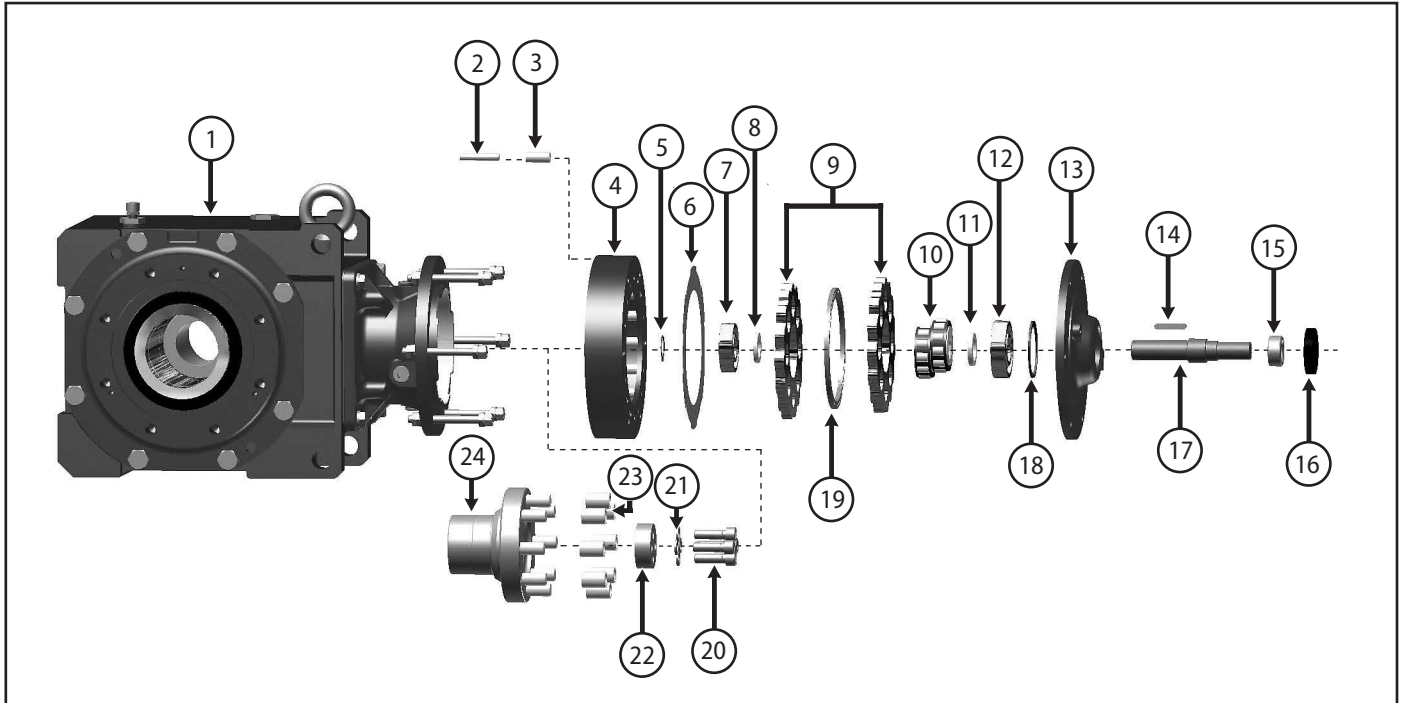


**Parts****BBB4 Reducer****BBB4 Reducer Parts****Table 35. BBB4 Reducer Parts**

| 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                      |

Parts, continued

Cyclo Planetary Reduction Component Parts

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

Cyclo Planetary Reduction Component

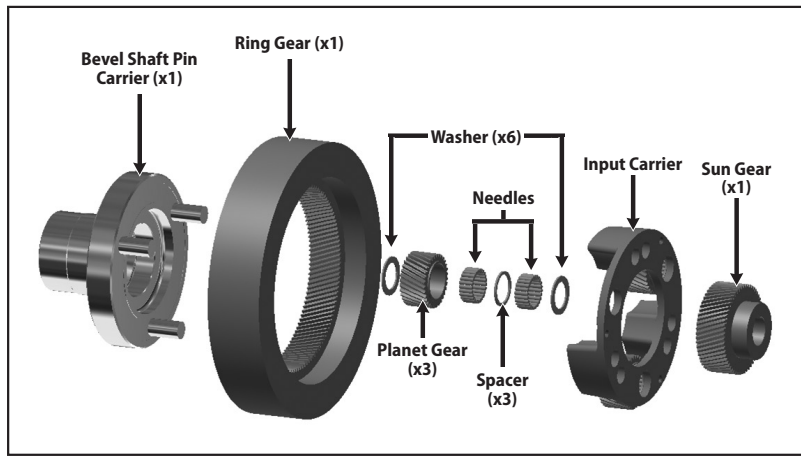
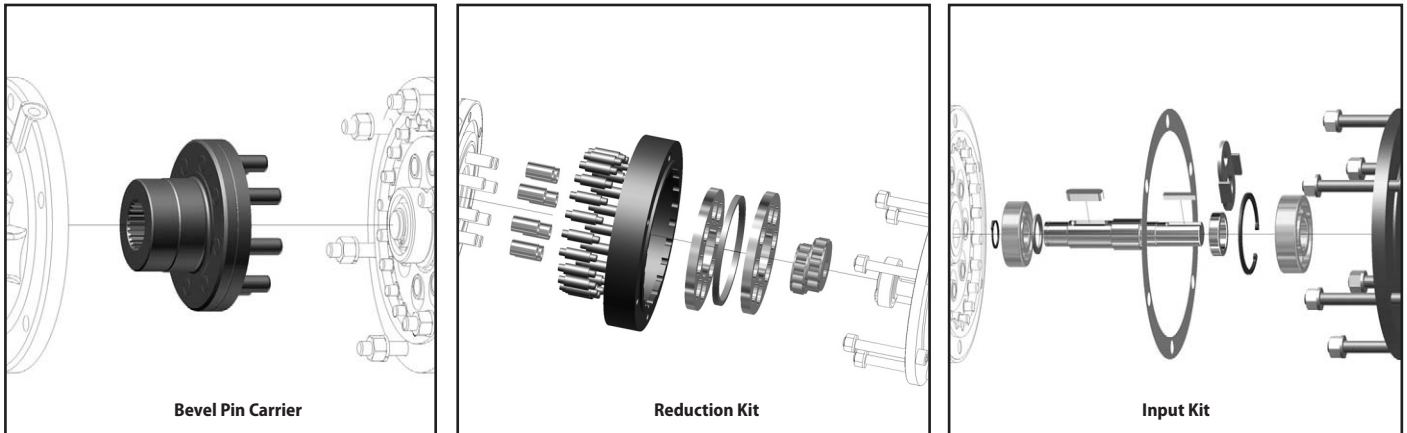


Table 36. Cyclo Planetary Reduction Component Part Numbers (Ratios 11 - 18:1)

| Unit Size                                       | Reduction Ratio (nominal) |                 | Cyclo Planetary Reduction Part Numbers |             |           |          |         |         |         |               |                                                          |
|-------------------------------------------------|---------------------------|-----------------|----------------------------------------|-------------|-----------|----------|---------|---------|---------|---------------|----------------------------------------------------------|
|                                                 | Overall                   | Cyclo Planetary | Reduction Block Set (gears & bearings) | Planet Gear | Ring Gear | Sun Gear | Needles | Spacer  | Washer  | Input Carrier | Bevel Shaft Pin Carrier                                  |
| 4A100<br>4A105                                  | 11                        | 3:1             | 931SD610-003G                          | AN8911G     | AN8303G   | AN8910G  | -       | AW5434G | -       | -             | BL515LG                                                  |
|                                                 | 13, 14                    | 4:1             | 931SD610-004G                          | AN8870G     | AN8871G   | AN8869G  |         |         |         |               |                                                          |
|                                                 | 16, 18                    | 5:1             | 931SD610-005G                          | AN8305G     | AN8306G   | AN8304G  |         |         |         |               |                                                          |
| 4A120, 4A125<br>4B120, 4B125                    | 11                        | 3:1             | 931BB612-003G                          | AP8712G     | CJ584LG   | AP8711G  | AX2806G | AX2543G | AX2761G | CJ244LG       | CJ701LG (for 4A)<br>CJ703LG (for 4B)                     |
|                                                 | 13, 14                    | 4:1             | 931BB612-004G                          | AP8706G     | CJ554LG   | AP8705G  |         |         |         |               |                                                          |
|                                                 | 16, 18                    | 5:1             | 931BB612-005G                          | AP8714G     | CJ585LG   | AP8713G  |         |         |         |               |                                                          |
| 4A140, 4A145<br>4B140, 4B145<br>4C140, 4C145    | 11                        | 3:1             | 931BB614-003G                          | AP8717G     | CJ586LG   | AP8716G  | AX2807G | AX2763G | AX2544G | CJ588LG       | CJ702LG (for 4A)<br>CJ704LG (for 4B)<br>CJ706LG (for 4C) |
|                                                 | 13, 14                    | 4:1             | 931BB614-004G                          | AP8708G     | CJ555LG   | AP8707G  |         |         |         |               |                                                          |
|                                                 | 16, 18                    | 5:1             | 931BB614-005G                          | AP8719G     | CJ587LG   | AP8718G  |         |         |         |               |                                                          |
| 4B160, 4B165<br>4C160, 4C165                    | 11                        | 3:1             | 931BB616-003G                          | AP8721G     | CJ589LG   | AP8720G  | AX2808G | AX2555G | AX2554G | CJ591LG       | CJ705LG (for 4B)<br>CJ707LG (for 4C)                     |
|                                                 | 13, 14                    | 4:1             | 931BB616-004G                          | AP8710G     | CJ556LG   | AP8709G  |         |         |         |               |                                                          |
|                                                 | 16, 18                    | 5:1             | 931BB616-005G                          | AP8726G     | CJ590LG   | AP8722G  |         |         |         |               |                                                          |
| 4C170, 4C175<br>4D170, 4D175<br>4E170, 4E175    | 11                        | 3:1             | 931BB617-003G                          | AP9278G     | CJ993LG   | AP9277G  | AX3077G | AX3061G | AX3060G | CJ996LG       | CJ938LG (for 4C)<br>CK009LG (for 4D, 4E)                 |
|                                                 | 13, 14                    | 4:1             | 931BB617-004G                          | AP9280G     | CJ994LG   | AP9279G  |         |         |         |               |                                                          |
|                                                 | 16, 18                    | 5:1             | 931BB617-005G                          | AP9282G     | CJ995LG   | AP9281G  |         |         |         |               |                                                          |
| 4D180,<br>4D185<br>4E180, 4E185<br>4F180, 4F185 | 11                        | 3:1             | 931BB618-003G                          | AP9285G     | CJ997LG   | AP9284G  | AX3077G | AX3061G | AX3060G | CK001LG       | CJ961LG (for 4D, 4E)<br>CJ965LG (for 4F)                 |
|                                                 | 13, 14                    | 4:1             | 931BB618-004G                          | AP9287G     |           | AP9286G  |         |         |         | CK002LG       | CJ960LG (for 4D, 4E)<br>CJ966LG (for 4F)                 |
|                                                 | 16, 18                    | 5:1             | 931BB618-005G                          | AP9289G     |           | AP9288G  |         |         |         | CK003LG       | CJ959LG (for 4D, 4E)<br>CJ967LG (for 4F)                 |
| 4E190, 4E195<br>4F190, 4F195                    | 11                        | 3:1             | 931BB619-003G                          | AP9292G     | CK004LG   | AP9291G  | AX3077G | AX3061G | AX3060G | CK007LG       | CJ962LG (for 4E)<br>CJ968LG (for 4F)                     |
|                                                 | 13, 14                    | 4:1             | 931BB619-004G                          | AP9294G     |           | AP9293G  |         |         |         | CK006LG       | CJ963LG (for 4E)<br>CJ969LG (for 4F)                     |
|                                                 | 16, 18                    | 5:1             | 931BB619-005G                          | AP9296G     |           | AP9295G  |         |         |         | CK008LG       | CJ964LG (for 4E)<br>CJ970LG (for 4F)                     |

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

**Parts,** continued**Cyclo Reduction Component Parts****BBB4 Reduction Component Part Numbers (Ratios  $\geq 19:1$ )****BBB4 Reduction Components - 4A100 thru 4F195****Table 37. BBB4 Reduction Component Part Numbers (Ratios  $\geq 19:1$ )**

| Unit Size      | Reduction Ratio |       | Part Numbers      |                         |                   |
|----------------|-----------------|-------|-------------------|-------------------------|-------------------|
|                | Overall         | Cyclo | Input Kit         | Reduction Kit           | Bevel Pin Carrier |
| 4A100<br>4A105 | 19, 21          | 6     | 930HY610-<br>EOLG | 931SD610-006G           | BL514LG           |
|                | 22, 25          | 7     |                   | See Note <sup>[1]</sup> |                   |
|                | 26, 28          | 8     |                   | 931SD610-008G           |                   |
|                | 35, 39          | 11    |                   | 931SD610-011G           |                   |
|                | 42, 46          | 13    |                   | 931SD610-013G           |                   |
|                | 48, 53          | 15    |                   | 931SD610-015G           |                   |
|                | 54, 60          | 17    |                   | 931SD610-017G           |                   |
|                | 67, 74          | 21    |                   | 931SD610-021G           |                   |
|                | 80, 88          | 25    |                   | 931SD610-025G           |                   |
|                | 93, 102         | 29    |                   | 931SD610-029G           |                   |
|                | 112, 123        | 35    |                   | 931SD610-035G           |                   |
|                | 138, 151        | 43    |                   | 931SD610-043G           |                   |
|                | 163, 179        | 51    |                   | 931SD610-051G           |                   |
|                | 189, 207        | 59    |                   | 931SD610-059G           |                   |
|                | 227, 249        | 71    |                   | 931SD610-071G           |                   |
| 4A110<br>4A115 | 278, 305        | 89    | 930HY611-<br>EOLG | 931SD610-087G           | BL514LG           |
|                | 364, 417        | 119   |                   | 931SD610-119G           |                   |
|                | 19, 21          | 6     |                   | 931SD611-006G           |                   |
|                | 22, 25          | 7     |                   | See Note <sup>[1]</sup> |                   |
|                | 26, 28          | 8     |                   | 931SD611-008G           |                   |
|                | 35, 39          | 11    |                   | 931SD611-011G           |                   |
|                | 42, 46          | 13    |                   | 931SD611-013G           |                   |
| 4A110<br>4A115 | 48, 53          | 15    | 930HY611-<br>EOLG | 931SD611-015G           | BL514LG           |
|                | 54, 60          | 17    |                   | 931SD611-017G           |                   |
|                | 67, 74          | 21    |                   | 931SD611-021G           |                   |
|                | 80, 88          | 25    |                   | 931SD611-025G           |                   |
|                | 93, 102         | 29    |                   | 931SD611-029G           |                   |
|                | 112, 123        | 35    |                   | 931SD611-035G           |                   |
|                | 138, 151        | 43    |                   | 931SD611-043G           |                   |
|                | 163, 179        | 51    |                   | 931SD611-051G           |                   |
|                | 189, 207        | 59    |                   | 931SD611-059G           |                   |
|                | 227, 249        | 71    |                   | 931SD611-071G           |                   |
|                | 278, 305        | 89    |                   | 931SD611-087G           |                   |
|                | 364, 417        | 119   |                   | 931SD611-119G           |                   |

Note: [1] Consult Factory

Parts, continued

Cyclo Reduction Component Parts

Table 38. BBB4 Reduction Components Part Numbers (Ratios >19:1), continued

| Unit Size                        | Reduction Ratio |       | Part Numbers      |               |                   |         |
|----------------------------------|-----------------|-------|-------------------|---------------|-------------------|---------|
|                                  | Overall         | Cyclo | Input Kit         | Reduction Kit | 4A12              | 4B12    |
|                                  |                 |       |                   |               | Bevel Pin Carrier |         |
| 4A120<br>4A125<br>4B120<br>4B125 | 19, 21          | 6     | 930HY612-<br>EOLG | 931SD612-006G | CJ691LG           | CJ693LG |
|                                  | 22, 25          | 7     |                   | 931SD612-007G |                   |         |
|                                  | 26, 28          | 8     |                   | 931SD612-008G |                   |         |
|                                  | 35, 39          | 11    |                   | 931SD612-011G |                   |         |
|                                  | 42, 46          | 13    |                   | 931SD612-013G |                   |         |
|                                  | 48, 53          | 15    |                   | 931SD612-015G |                   |         |
|                                  | 54, 60          | 17    |                   | 931SD612-017G |                   |         |
|                                  | 67, 74          | 21    |                   | 931SD612-021G |                   |         |
|                                  | 80, 88          | 25    |                   | 931SD612-025G |                   |         |
|                                  | 93, 102         | 29    |                   | 931SD612-029G |                   |         |
|                                  | 112, 123        | 35    |                   | 931SD612-035G |                   |         |
|                                  | 138, 151        | 43    |                   | 931SD612-043G |                   |         |
|                                  | 163, 179        | 51    |                   | 931SD612-051G |                   |         |
|                                  | 189, 207        | 59    |                   | 931SD612-059G |                   |         |
|                                  | 227, 249        | 71    |                   | 931SD612-071G |                   |         |
|                                  | 278, 305        | 87    |                   | 931SD612-087G |                   |         |
|                                  | 364, 417        | 119   |                   | 931SD612-119G |                   |         |

| Unit Size                                          | Reduction Ratio |       | Part Numbers      |               |                   |         |         |
|----------------------------------------------------|-----------------|-------|-------------------|---------------|-------------------|---------|---------|
|                                                    | Overall         | Cyclo | Input Kit         | Reduction Kit | 4A14              | 4B14    | 4C14    |
|                                                    |                 |       |                   |               | Bevel Pin Carrier |         |         |
| 4A140<br>4A145<br>4B140<br>4B145<br>4C140<br>4C145 | 19, 21          | 6     | 930HS614-<br>EBBG | 931SD614-006G | CJ692LG           | CJ694LG | CJ696LG |
|                                                    | 22, 25          | 7     |                   | 931SD614-007G |                   |         |         |
|                                                    | 26, 28          | 8     |                   | 931SD614-008G |                   |         |         |
|                                                    | 35, 39          | 11    |                   | 931SD614-011G |                   |         |         |
|                                                    | 42, 46          | 13    |                   | 931SD614-013G |                   |         |         |
|                                                    | 48, 53          | 15    |                   | 931SD614-015G |                   |         |         |
|                                                    | 54, 60          | 17    |                   | 931SD614-017G |                   |         |         |
|                                                    | 67, 74          | 21    |                   | 931SD614-021G |                   |         |         |
|                                                    | 80, 88          | 25    |                   | 931SD614-025G |                   |         |         |
|                                                    | 93, 102         | 29    |                   | 931SD614-029G |                   |         |         |
|                                                    | 112, 123        | 35    |                   | 931SD614-035G |                   |         |         |
|                                                    | 138, 151        | 43    |                   | 931SD614-043G |                   |         |         |
|                                                    | 163, 179        | 51    |                   | 931SD614-051G |                   |         |         |
|                                                    | 189, 207        | 59    |                   | 931SD614-059G |                   |         |         |
|                                                    | 227, 249        | 71    |                   | 931SD614-071G |                   |         |         |
|                                                    | 278, 305        | 87    |                   | 931SD614-087G |                   |         |         |
|                                                    | 364, 417        | 119   |                   | 931SD614-119G |                   |         |         |

| Unit Size                                                                                                           | Reduction Ratio |       | Part Numbers      |               |                   |         |         |
|---------------------------------------------------------------------------------------------------------------------|-----------------|-------|-------------------|---------------|-------------------|---------|---------|
|                                                                                                                     | Overall         | Cyclo | Input Kit         | Reduction Kit | 4B16              | 4C16    | 4D16    |
|                                                                                                                     |                 |       |                   |               | Bevel Pin Carrier |         |         |
| 4B160<br>4B165<br>4C160<br>4C165<br>4D160<br>4C165"<br><br>163, 179<br>189, 207<br>227, 249<br>278, 305<br>364, 417 | 19, 21          | 6     | 930HY616-<br>JBBG | 931SD616-006G | CJ695LG           | CJ697LG | CJ699LG |
|                                                                                                                     | 22, 25          | 7     |                   | 931SD616-007G |                   |         |         |
|                                                                                                                     | 26, 28          | 8     |                   | 931SD616-008G |                   |         |         |
|                                                                                                                     | 35, 39          | 11    |                   | 931SD616-011G |                   |         |         |
|                                                                                                                     | 42, 46          | 13    |                   | 931SD616-013G |                   |         |         |
|                                                                                                                     | 48, 53          | 15    |                   | 931SD616-015G |                   |         |         |
|                                                                                                                     | 54, 60          | 17    |                   | 931SD616-017G |                   |         |         |
|                                                                                                                     | 67, 74          | 21    |                   | 931SD616-021G |                   |         |         |
|                                                                                                                     | 80, 88          | 25    |                   | 931SD616-025G |                   |         |         |
|                                                                                                                     | 93, 102         | 29    |                   | 931SD616-029G |                   |         |         |
|                                                                                                                     | 112, 123        | 35    |                   | 931SD616-035G |                   |         |         |
|                                                                                                                     | 138, 151        | 43    |                   | 931SD616-043G |                   |         |         |
|                                                                                                                     | 163, 179        | 51    |                   | 931SD616-051G |                   |         |         |
|                                                                                                                     | 189, 207        | 59    |                   | 931SD616-059G |                   |         |         |
|                                                                                                                     | 227, 249        | 71    |                   | 931SD616-071G |                   |         |         |
|                                                                                                                     | 278, 305        | 87    |                   | 931SD616-087G |                   |         |         |
|                                                                                                                     | 364, 417        | 119   |                   | 931SD616-119G |                   |         |         |

| Unit Size                                                                                                           | Reduction Ratio |       | Part Numbers      |               |                   |               |  |
|---------------------------------------------------------------------------------------------------------------------|-----------------|-------|-------------------|---------------|-------------------|---------------|--|
|                                                                                                                     | Overall         | Cyclo | Input Kit         | Reduction Kit | 4C17              | 4D17,<br>4E17 |  |
|                                                                                                                     |                 |       |                   |               | Bevel Pin Carrier |               |  |
| 4C170<br>4C175<br>4D170<br>4D175<br>4E170<br>4E175"<br><br>163, 179<br>189, 207<br>227, 249<br>278, 305<br>364, 417 | 19, 21          | 6     | 930HY617-<br>JBBG | 931SD617-006G | CJ698LG           | CJ700LG       |  |
|                                                                                                                     | 22, 25          | 7     |                   | 931SD617-007G |                   |               |  |
|                                                                                                                     | 26, 28          | 8     |                   | 931SD617-008G |                   |               |  |
|                                                                                                                     | 35, 39          | 11    |                   | 931SD617-011G |                   |               |  |
|                                                                                                                     | 42, 46          | 13    |                   | 931SD617-013G |                   |               |  |
|                                                                                                                     | 48, 53          | 15    |                   | 931SD617-015G |                   |               |  |
|                                                                                                                     | 54, 60          | 17    |                   | 931SD617-017G |                   |               |  |
|                                                                                                                     | 67, 74          | 21    |                   | 931SD617-021G |                   |               |  |
|                                                                                                                     | 80, 88          | 25    |                   | 931SD617-025G |                   |               |  |
|                                                                                                                     | 93, 102         | 29    |                   | 931SD617-029G |                   |               |  |
|                                                                                                                     | 112, 123        | 35    |                   | 931SD617-035G |                   |               |  |
|                                                                                                                     | 138, 151        | 43    |                   | 931SD617-043G |                   |               |  |
|                                                                                                                     | 163, 179        | 51    |                   | 931SD617-051G |                   |               |  |
|                                                                                                                     | 189, 207        | 59    |                   | 931SD617-059G |                   |               |  |
|                                                                                                                     | 227, 249        | 71    |                   | 931SD617-071G |                   |               |  |
|                                                                                                                     | 278, 305        | 87    |                   | 931SD617-087G |                   |               |  |
|                                                                                                                     | 364, 417        | 119   |                   | 931SD617-119G |                   |               |  |

| Unit Size                                           | Reduction Ratio |       | Part Numbers      |               |                   |      |         |
|-----------------------------------------------------|-----------------|-------|-------------------|---------------|-------------------|------|---------|
|                                                     | Overall         | Cyclo | Input Kit         | Reduction Kit | 4D18              | 4E18 | 4F18    |
|                                                     |                 |       |                   |               | Bevel Pin Carrier |      |         |
| 4D180<br>4D185<br>4E180<br>4E185<br>4F180<br>4F185" | 19, 21          | 6     | 930HY618-<br>JBBG | 931SD618-006G | CJ955LG           |      | CJ957LG |
|                                                     | 22, 25          | 7     |                   | 931SD618-007G |                   |      |         |
|                                                     | 26, 28          | 8     |                   | 931SD618-008G |                   |      |         |
|                                                     | 35, 39          | 11    |                   | 931SD618-011G | CK012LG           |      | CK016LG |
|                                                     | 42, 46          | 13    |                   | 931SD618-013G |                   |      |         |
|                                                     | 48, 53          | 15    |                   | 931SD618-015G |                   |      |         |
|                                                     | 54, 60          | 17    |                   | 931SD618-017G |                   |      |         |
|                                                     | 67, 74          | 21    |                   | 931SD618-021G |                   |      |         |
|                                                     | 80, 88          | 25    |                   | 931SD618-025G |                   |      |         |
|                                                     | 93, 102         | 29    |                   | 931SD618-029G |                   |      |         |
|                                                     | 112, 123        | 35    |                   | 931SD618-035G |                   |      |         |
|                                                     | 138, 151        | 43    |                   | 931SD618-043G |                   |      |         |
|                                                     | 163, 179        | 51    |                   | 931SD618-051G |                   |      |         |
|                                                     | 189, 207        | 59    |                   | 931SD618-059G |                   |      |         |
|                                                     | 227, 249        | 71    |                   | 931SD618-071G |                   |      |         |
|                                                     | 278, 305        | 87    |                   | 931SD618-087G |                   |      |         |
|                                                     | 364, 417        | 119   |                   | 931SD618-119G |                   |      |         |

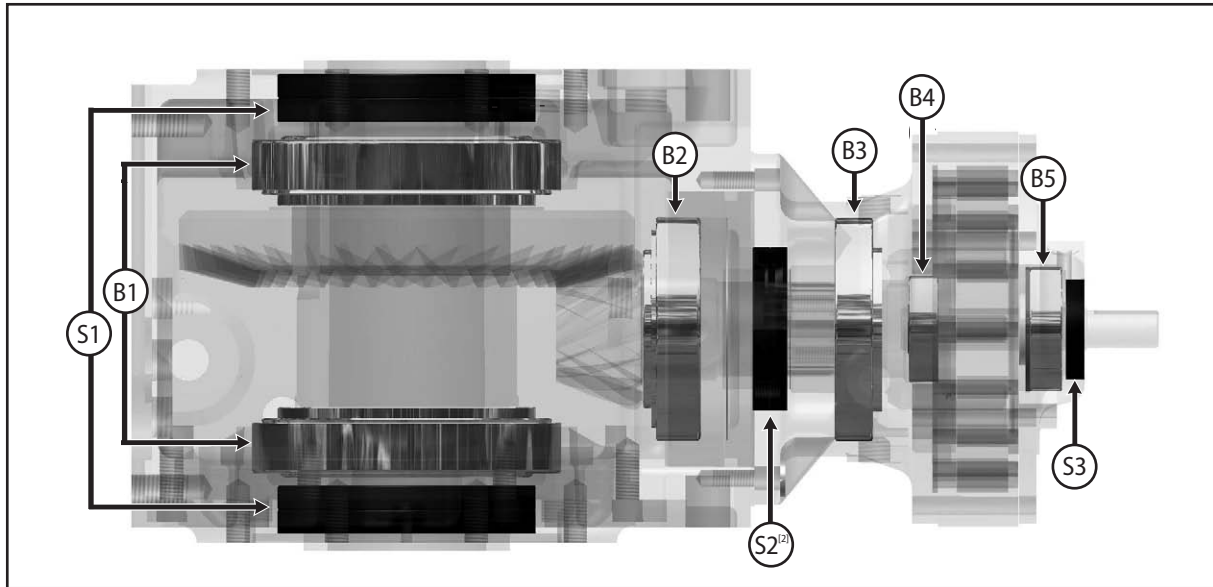
| Unit Size                         | Reduction Ratio |       | Part Numbers      |               |                   |         |  |
|-----------------------------------|-----------------|-------|-------------------|---------------|-------------------|---------|--|
|                                   | Overall         | Cyclo | Input Kit         | Reduction Kit | 4E19              | 4F19    |  |
|                                   |                 |       |                   |               | Bevel Pin Carrier |         |  |
| 4E190<br>4E195<br>4F190<br>4F195" | 19, 21          | 6     | 930HY619-<br>JBBG | 931SD619-006G | CJ956LG           | CJ931LG |  |
|                                   | 22, 25          | 7     |                   | 931SD619-007G |                   |         |  |
|                                   | 26, 28          | 8     |                   | 931SD619-008G |                   |         |  |
|                                   | 35, 39          | 11    |                   | 931SD619-011G |                   |         |  |
|                                   | 42, 46          | 13    |                   | 931SD619-013G |                   |         |  |
|                                   | 48, 53          | 15    |                   | 931SD619-015G |                   |         |  |
|                                   | 54, 60          | 17    |                   | 931SD619-017G |                   |         |  |
|                                   | 67, 74          | 21    |                   | 931SD619-021G |                   |         |  |
|                                   | 80, 88          | 25    |                   | 931SD619-025G |                   |         |  |
|                                   | 93, 102         | 29    |                   | 931SD619-029G |                   |         |  |
|                                   | 112, 123        | 35    |                   | 931SD619-035G |                   |         |  |
|                                   | 138, 151        | 43    |                   | 931SD619-043G |                   |         |  |
|                                   | 163, 179        | 51    |                   | 931SD619-051G |                   |         |  |
|                                   | 189, 207        | 59    |                   | 931SD619-059G |                   |         |  |
|                                   | 227, 249        | 71    |                   | 931SD619-071G |                   |         |  |
|                                   | 278, 305        | 87    |                   | 931SD619-087G |                   |         |  |
|                                   | 364, 417        | 119   |                   | 931SD619-119G |                   |         |  |

## Parts, continued

### Bearings and Oil Seals

## Bearings and Oil Seals

### BBB4 Bearings and Oil Seals



**Table 39. BBB4 Reducer Bearings and Oil Seals**

| Unit Size                                                            | Bearings |       |       |          |       | Oil Seals <sup>[1]</sup> |                    |                   |
|----------------------------------------------------------------------|----------|-------|-------|----------|-------|--------------------------|--------------------|-------------------|
|                                                                      | B1       | B2    | B3    | B4       | B5    | S1 <sup>[2]</sup>        | S2 <sup>[3]</sup>  | S3                |
| 4A100<br>4A105<br>4A110<br>4A115<br>4A120<br>4A125<br>4A140<br>4A145 | 32017    | 32308 | 32011 | 6302RSH2 | 6302Z | D<br>85 x 110 x 13       | S<br>50 x 68 x 9   | S<br>20 x 35 x 7  |
|                                                                      |          |       | 32013 | 6304     | 6305Z |                          |                    | D<br>32 x 52 x 8  |
|                                                                      |          |       | 30215 | 6305R    | 6306  |                          |                    | D<br>38 x 58 x 11 |
| 4B120<br>4B125<br>4B140<br>4B145<br>4B160<br>4B165                   |          |       | 32013 | 6304     | 6305Z |                          |                    | D<br>32 x 52 x 8  |
|                                                                      |          |       | 30215 | 6305R    | 6306  |                          |                    | D<br>38 x 58 x 11 |
|                                                                      |          |       | 30217 | 6307R    | 6308  |                          |                    | D<br>55 x 78 x 12 |
|                                                                      |          |       |       |          |       |                          |                    | D<br>38 x 58 x 11 |
| 4C140<br>4C145<br>4C160<br>4C165<br>4C170<br>4C175                   | 32024    | 32312 | 30215 | 6305R    | 6306  | D<br>120 x 150 x 14      | S<br>70 x 95 x 13  | D<br>55 x 78 x 12 |
|                                                                      |          |       | 30217 | 6307R    | 6308  |                          |                    | D<br>62 x 82 x 12 |
|                                                                      |          |       | 30220 | 6406     | 6407  |                          |                    | D<br>62 x 82 x 12 |
| 4D160<br>4D165<br>4D170<br>4D175<br>4D180<br>4D185                   |          |       | 30217 | 6307R    | 6308  |                          |                    | D<br>55 x 78 x 12 |
|                                                                      |          |       | 30220 | 6406     | 6407  |                          |                    | D<br>62 x 82 x 12 |
|                                                                      |          |       | 30222 | 6407     | 6409  |                          |                    | D<br>65 x 88 x 12 |
| 4E170<br>4E175<br>4E180<br>4E185<br>4E190<br>4E195                   | 32032    | 32315 | 30220 | 6406     | 6407  | D<br>160 x 190 x 16      | S<br>90 x 115 x 13 | D<br>62 x 82 x 12 |
|                                                                      |          |       | 30222 | 6407     | 6409  |                          |                    | D<br>65 x 88 x 12 |
|                                                                      |          |       | 30226 | 6408     | 6411  |                          |                    | S<br>70 x 88 x 10 |
| 4F180<br>4F185<br>4F190<br>4F195                                     |          |       | 30226 | 6407     | 6409  |                          |                    | D<br>65 x 88 x 12 |
|                                                                      |          |       | 30230 | 6408     | 6411  |                          |                    | S<br>70 x 88 x 10 |
|                                                                      |          |       |       |          |       |                          |                    |                   |

**Notes:** [1] D = Double Lip Seal. S = Single Lip Seal. Seal Dimensions are in mm.

[2] A total of 4 seals are needed - two on top and two on bottom

[3] for "Y4" assembly and grease lubricated units only

Parts, continued

Bevel Gearing Parts and Tooth Count

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.

BBB4 Bevel Gearing Tooth Count

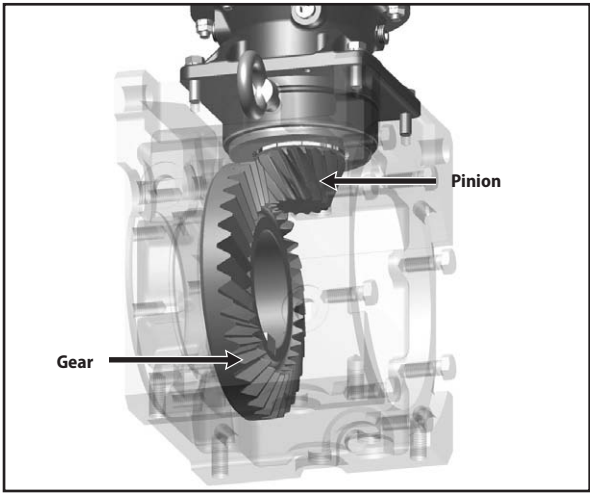


Table 40. BBB4 Ratios

| BBB4<br>Nominal Ratio | Bevel<br>Ratio | Cyclo<br>Input Ratio |
|-----------------------|----------------|----------------------|
| 11                    | 3.5            | 3 <sup>[1]</sup>     |
| 13                    | 3.2            | 4 <sup>[1]</sup>     |
| 14                    | 3.5            | 4 <sup>[1]</sup>     |
| 16                    | 3.2            | 5 <sup>[1]</sup>     |
| 18                    | 3.5            | 5 <sup>[1]</sup>     |
| 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

| BBB4<br>Nominal Ratio | Bevel<br>Ratio | Cyclo<br>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                  |

| BBB4<br>Nominal Ratio | Bevel<br>Ratio | Cyclo<br>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 BBB4 nominal ratio and corresponding bevel ratio from Table 36. Then reference Table 37 to identify the actual number of bevel gear and pinion teeth.

Table 41. Bevel Tooth Count and Part Numbers

| Bevel<br>Ratio | Number of Teeth |      | Bevel Gear Set Part Number |                     |                     |               |               |                  |               |
|----------------|-----------------|------|----------------------------|---------------------|---------------------|---------------|---------------|------------------|---------------|
|                | Pinion          | Gear | 4A10, 4A11<br>4A12, 4A14   | 4B12, 4B14,<br>4B16 | 4C14, 4C16,<br>4C17 | 4D16          | 4D17, 4D18    | 4E17, 4E18, 4E19 | 4F18, 4F19    |
| 3.2            | 10              | 32   | 998BBB-4A--BG              | 998BBB-4B--BG       | 998BBB-4C--BG       | 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 |