



Emerson Power Transmission  
P. O. Box 687  
MAYSVILLE, KY 41056  
Phone: 800-626-2093  
www.emerson-ept.com

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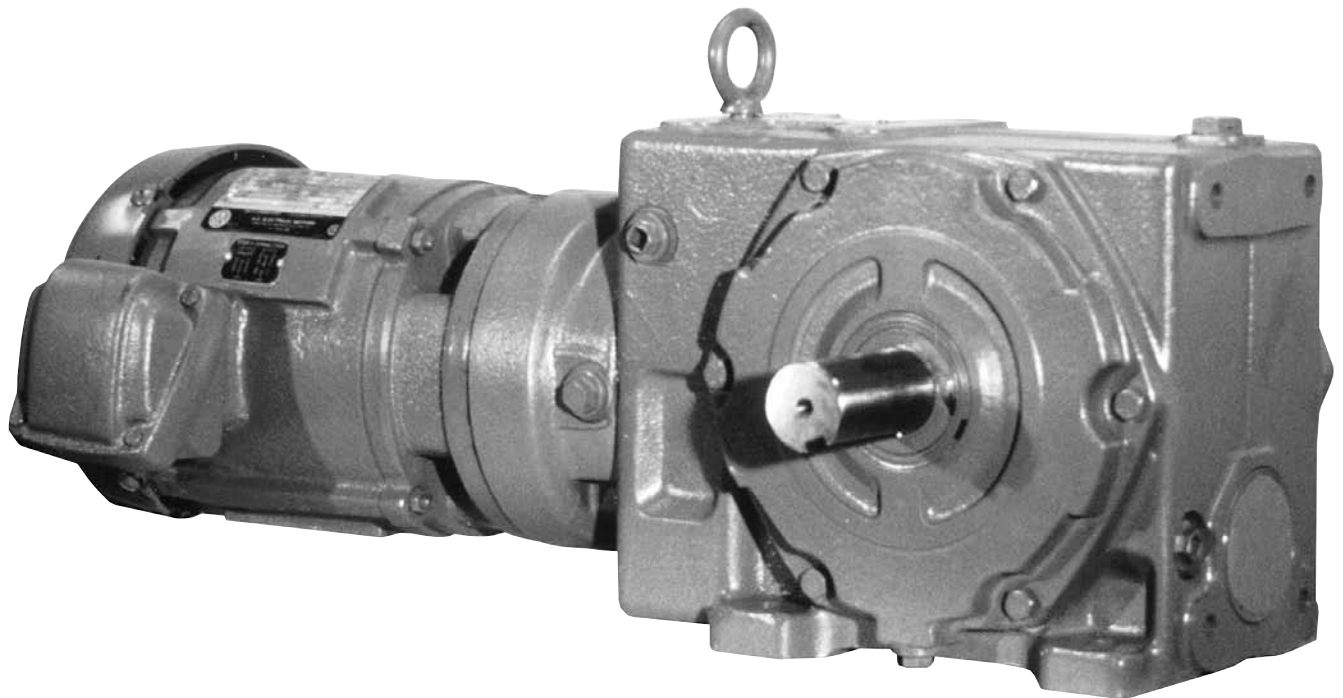
## Installation and Maintenance Manual For OtN Series 2000 Gearmotors and Reducers

### **⚠ WARNING**

- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.
- Read and follow all instructions carefully.

### **⚠ CAUTION**

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.



### Installation Instructions

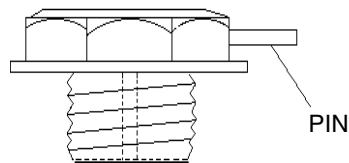
#### Start-Up

Before operating the reducer or gearmotor, the following must be done:

- Install the drive on a rigid and vibration-free surface.
- Remove the protective coating on the shaft and flange. Use solvent if necessary.
- Carefully install coupling, sheaves, sprockets, or pinions on shaft. Mount as close to the shaft shoulder as possible.
- It is preferable to use heat instead of force. **Do not hammer on shaft!**
- Check shaft alignment when using direct coupling.
- Check shaft parallelism when using belt or chain drive.

**CAUTION:** Refer to belt manufacturer's recommendation for belt tension. (Tension should not be applied on chain drives.)

- Check oil level in oil lubricated reducer.
- Install breather plug in the plug hole per recommendations shown on page (3). **Remove pin from center of breather plug if breather design is per diagram below.**



- Reducer breathers not supplied with cross-pin do not get modified but must be properly positioned at the top of the reducer.
- For motor/coupling mounting of reducers with one piece splined couplings, refer to instructions included on page 6 of this manual.

#### Maintenance

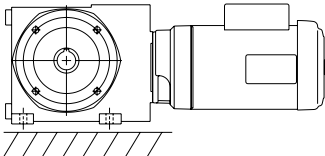
To ensure safe operation and to avoid problems, it is recommended the reducer or gearmotor be inspected **every 50 hours** of operating time.

- Check mounting bolts and belt tension (if applicable).

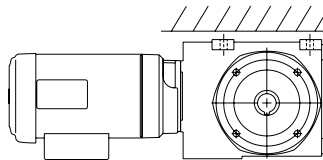
The preventative maintenance list below should be performed **every 5000 hours** of operating time:

- Check oil level and add oil if necessary.
- Make sure the vent hole in the breather is clean.

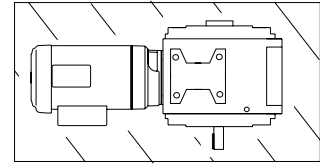
### 1) Gearbox Position (defined by a letter)



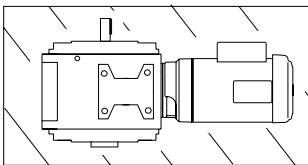
**B:** Floor Mounting



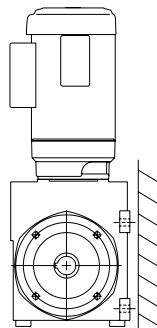
**P:** Ceiling Mounting



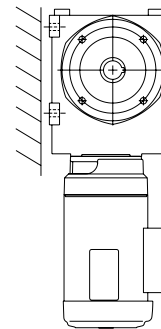
**H:** Wall-mounting, input on the left



**T:** Wall-mounting, motor on the right



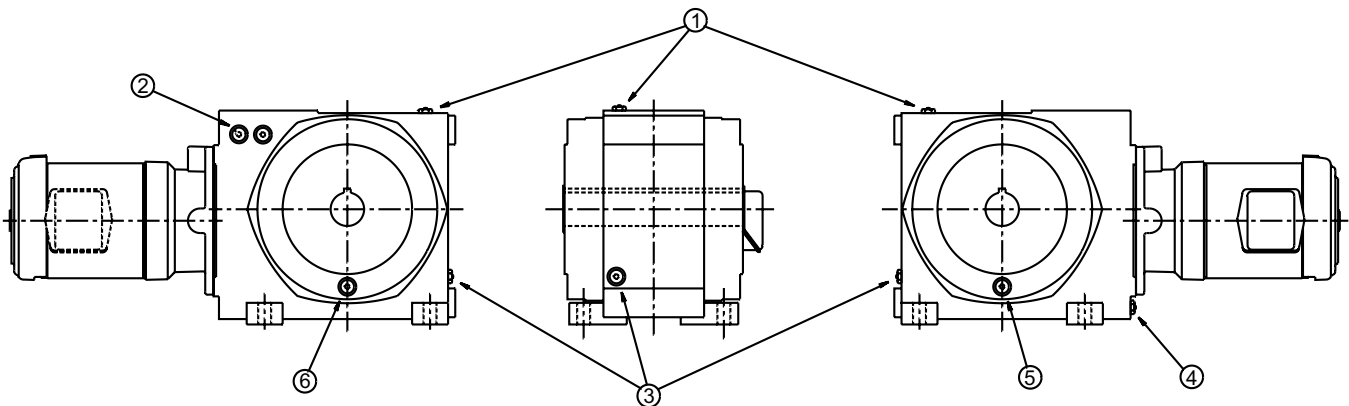
**V:** Wall-mounting, motor above



**W:** Wall-mounting, motor below

### Position of Plugs and Breathers

	<b>B</b>	<b>P</b>	<b>H</b>	<b>T</b>	<b>V</b>	<b>W</b>
Fill	1	4	5-4	6-2	4	3
Breather	1	4	5-4	6-2	4	3
Level	3	3	4	3	2	5
Drain	4	1	6	5	3	4





# OtN Series 2000

## Gearmotors and Reducers

Series 2000 OtN gearing is shipped with one of the following synthetic lubricants per the table below and fitted with a magnetic drain. Each reducer is filled according to the mounting position specified when ordered. Refer to unit nameplate and the chart to the left for mounting position arrangement for your unit.

In the case of synthetic oil, the lubricant does not require changing but it is recommended that proper oil level be checked periodically.

### Standard Synthetic Gear Oil

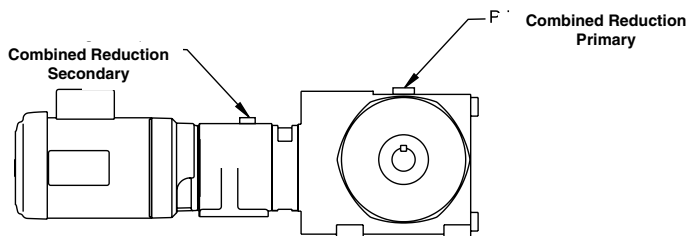
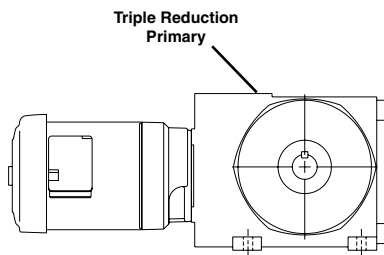
No Backstop	
Manufacturer	-25° F to 125° F (-30° C to 50° C)
Fuchs®	Sintogear® 125
Mobil®	SHC 629
Shell®	Omala® Fluids HD 150

With Backstop	
Manufacturer	-25° F to 125° F (-30° C to 50° C)
Shell	Omala RL 100

**CAUTION:** Never mix synthetic oil and mineral oil. Never use extreme pressure (EP) oil in a reducer with a backstop.

### Acceptable Mineral Oil Lubricants

Ambient Range of Installation				
-4°F to 14°F (-20°C to 10°C)	14°F to 122°F (-10°C to 50°C)			122°F and Above (50°C +)
	No Backstop		With Backstop	
ISO VG 68	ISO VG 100	ISO VG 150	ISO VG 220	ISO VG 320



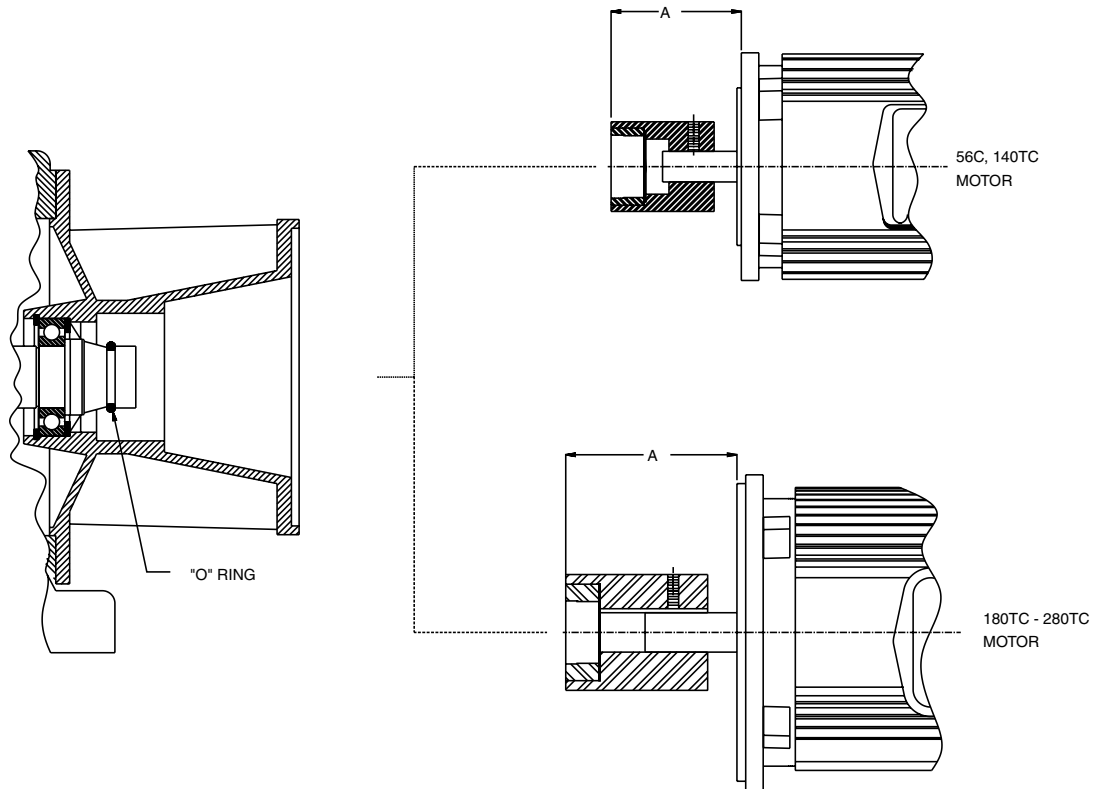
### Triple Reduction and Combined (U.S. Quarts)

Gear Frame Size	Mounting Positions											
	B		P		H		T		V		W	
	Prim.	Sec.	Prim.	Sec.	Prim.	Sec.	Prim.	Sec.	Prim.	Sec.	Prim.	Sec.
2203	0.40	-	1.80	-	1.50	-	1.30	-	1.60	-	1.10	-
2303/2305	1.00	0.40	5.00	0.40	5.50	0.40	5.50	0.40	6.00	1.26	3.50	1.17
2306	1.00	0.27	5.00	0.27	5.50	0.27	5.50	0.27	6.00	1.16	3.50	1.15
2403/2405	1.50	0.40	9.00	0.40	9.00	0.40	9.60	0.40	10.00	1.28	5.50	1.17
2406	1.50	0.27	9.00	0.24	9.00	0.27	9.60	0.27	10.00	1.16	5.50	1.15
2503/2505	3.00	0.40	17.00	0.40	19.00	0.40	18.00	0.40	20.00	1.26	11.50	1.17
2506	3.00	0.27	17.00	0.27	19.00	0.27	20.00	0.27	20.00	1.16	11.50	1.15
2603/2605	4.50	0.54	28.50	0.54	28.50	0.54	28.50	0.54	30.0	2.11	16.00	1.84
2606	4.50	0.50	28.50	0.50	28.50	0.50	28.50	0.50	30.0	2.00	16.00	1.80
2703/2705	6.00	1.67	39.00	1.67	37.00	1.67	40.00	1.67	42.0	4.40	21.00	4.40
2706	6.00	1.50	39.00	1.50	37.00	1.50	40.00	1.50	42.0	4.54	21.00	4.44
2803/2805	11.50	2.60	78.00	2.60	76.00	2.60	82.50	2.50	83.0	8.30	72.50	8.00
2806	11.50	2.30	76.00	2.30	76.00	2.30	82.50	2.30	83.0	8.00	72.50	7.80

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### One-Piece Splined Coupling (Type UE and U)

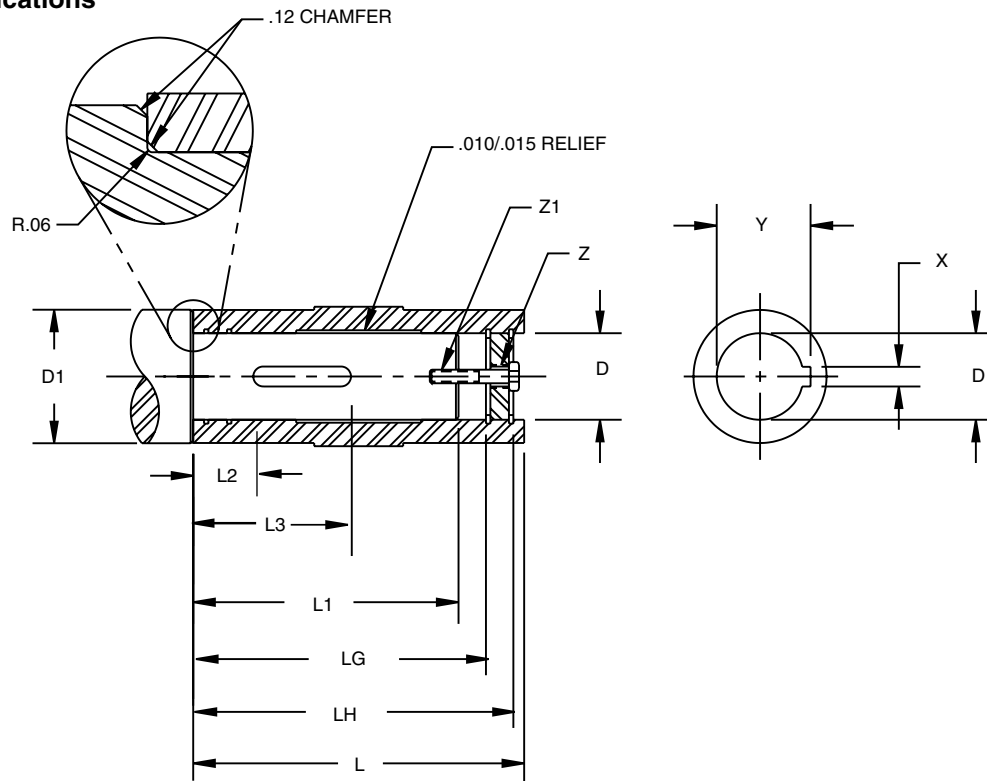


**Notes:**

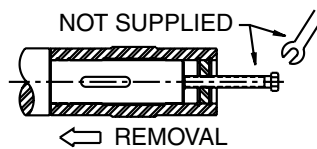
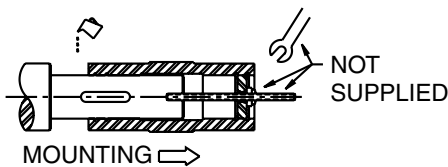
1. Install motor shaft key onto motor shaft.
2. Lubricate spline teeth of coupling and input shaft with Mobil grease XTC or equivalent coupling grease.
3. Install coupling onto motor shaft and set to the specified distance.  
Refer to table below (dimension "A") for correct setting distances.
4. Apply thread locking compound to set screw and install. Tighten into coupling.
5. Assemble motor to gear reducer engaging splined coupling and bolt the motor to the c-face.

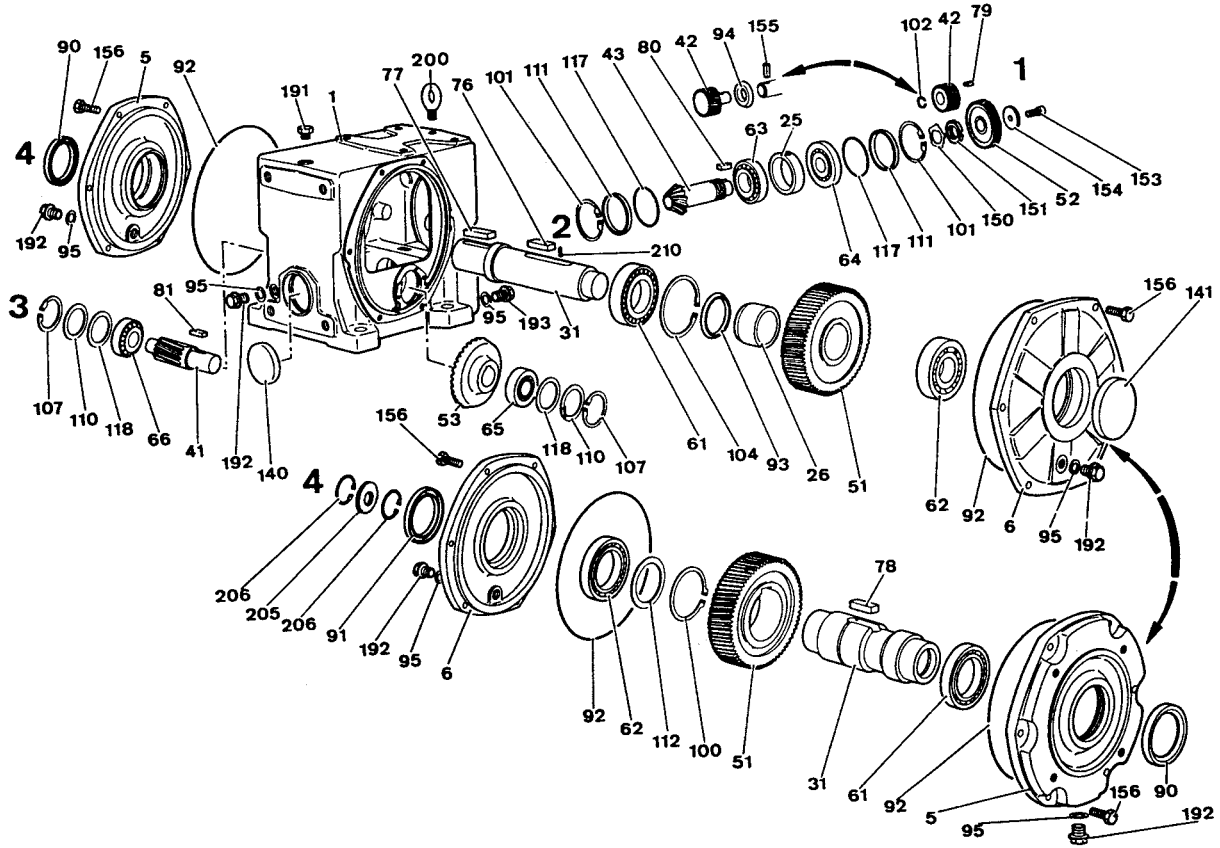
Input Type	Reducer Size	Motor Size	A (Inches)
	OtN		
UE	22, 23	56C, 140TC	3.06
		180TC, 210TC	4.04
UE	24, 25	56C, 140TC	3.12
		180TC, 210TC	4.11
		250TC	4.75
		280TC	5.64
U	26	140TC	3.86
		180TC, 210TC	5.34
		250TC	5.34
		280TC	6.31

#### Driven Shaft Specifications

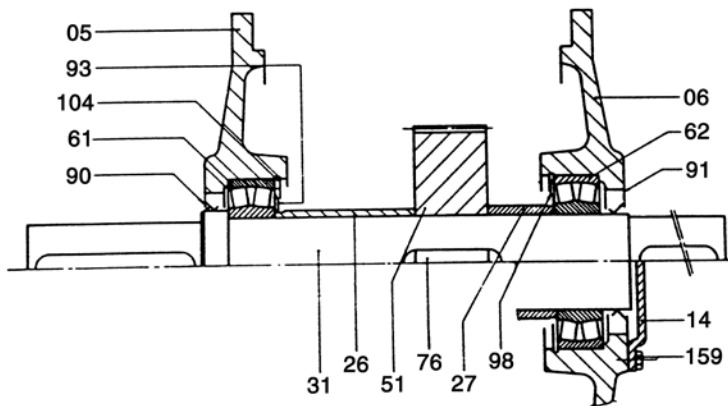


Gear Frame	Hollow Shaft							Driven Shaft				
	L	LG	LH	X	Y	Z UNC	D +.000 -.001	D1	L1	L2	L3	Z1 UNC
22	5.83	4.78	5.22	0.3125	1.531	5/8	1.375	1.75	4.69	1.00	2.75	1/2
23	8.30	7.20	7.75	3/8	1.600	1	1.437	2	7.10	1.00	3.75	5/8
24	9.90	8.60	9.39	1/2	2.061	1	1.875	2.45	8.25	1.00	5.00	5/8
25	11.65	10.12	11.06	5/8	2.646	1	2.375	2.85	9.85	1.25	6.25	3/4
26	12.20	10.63	11.54	5/8	3.027	1 1/4	2.750	3.35	10.25	1.25	6.25	3/4
27	13.40	11.81	12.72	3/4	3.454	1 1/4	3.125	3.75	11.40	1.25	7.25	3/4
28	16.90	15.12	16.14	7/8	4.009	1 1/4	3.625	4.35	14.95	1.50	7.50	1





#### Double output shaft (left and right side)





# OtN Series 2000

## Gearmotors and Reducers

### OtN Part List

Part #	Description	Qty.
001	Housing Pre-assembly *	1
005	Endshield, Output Side	1
006	Endshield, Opposite Side	1
014	Cover	1
025	Spacer, Axis 2	1
026	Spacer (Output shaft on left side)	1
027	Spacer (Output shaft D or X*)	1
031	Output Shaft	1
041	Pinion Axis 3	1
042	Pinion Axis 1, Motor Shaft	1
043	Bevel Pinion, Axis 2	1
044	Pinion Shaft Axis 2	1
051	Wheel Axis 4	1
052	Wheel Axis 2	1
053	Wheel Axis 3	1
061	Bearing Axis 4, Left	1
062	Bearing Axis 4, Right	1
063	Bearing Axis 3, Front	1
064	Bearing Axis 3, Rear	1
065	Bearing Axis 2, Right	1
066	Bearing Axis 2, Left	1
076-078	Key, Wheel (key for hollow shaft wheel)	1
077	Key	1
079	Key, Motor Shaft	1 or 2
080	Key, Axis 2	1
081	Key, Axis 3	1
090	Seal, Output Side	1
091	Seal, Opposite Side	1

Part #	Description	Qty.
092	"O" Ring Seal	2
093	Seal	1
095	Plug Seals	4
098	Seal	1
100	Retaining Ring, Hollow Shaft (Axis 4)	1
101	Retaining Ring, Axis 2	2
102	Retaining Ring, Motor Shaft	1
104	Retaining Ring, Axis 4	2
107	Retaining Ring Axis 2	2
110	Shims, Axis 3	x
111	Shims, Axis 2	x
112	Spacer, Hollow Shaft (Axis 4)	1
117	Spacer, Axis 2	2
118	Spacer, Axis 3	2
140	Cup Plug, Axis 2	1
141	Cup Plug	1
220+151	Nut and Washer	1
153	Screw (Wheel)	1
154	Washer, Inout Wheel	1
155	Pin, Shaft Pinion	1
156	Bolts, Journal Securing	12
159	Fixing Bolt, Cover 014	4
191	Filling Plug	1
192	Level Plug	1
193	Magnetic Drain Plug	1
200	Lifting Plug	1
205	Hollow Shaft Threaded Washer	1
206	Extractor Retaining Ring	2
210	Pin	1

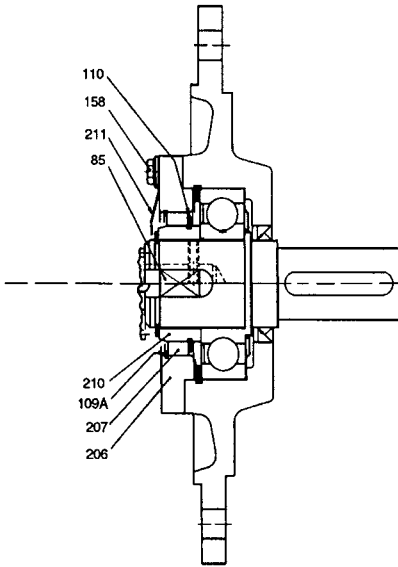
\* With bevel set and final pinion

Size	Shaft	Rep.								
		061	062	063	064	065	066	090	091	092
2203	G - D	6010 2RS	6010 2RS	30204	30304	32004	32004	50x80x13 BASL	-	-
	C - X	6010 2RS	6010 2RS	30204	30304	32004	32004	50x80x13 BASL	50x80x13 BASL	-
2303	G - D	6209 RS	NJ 205 E							
	C	6011 RS	6011 RS	32305	32305	32304	32304	55X68X8 AS	55X68X8 AS	185X3
	X	6209 RS	6308 RS						55X68X8 AS	
2403	G - D	22211	NJ 208 E							
	C	6013 RS	6013 RS	30306	30306	30305	32305	65x85x13 AS	65x85x13 AS	240x3
	X	22211	22211						65x85x13 AS	
2503	G - D	22213	6311					75x100x10 AS		
	C	6017 RS	6017 RS	32307 B	32307 B	33207	33207	85x110x12 AS		295x3
	X	22213	22215 E					75x100x10 AS	65x100x10 AS	
2603	G - D	22215 E	22215 E					80x100x10 AS		
	C	6019	6019	32308	32308	32308	32308	95x125x12 AS	95x125x13 AS	330x4
	X	22215 E	22215 E					75x100x10 AS	75x100x10 AS	
2703	G - D	22217 E	22217 E					95x125x12 AS		
	C	6022	6022	32310	32310	32309 B	32309	110x140x12 AS	110x140x12 AS	380x4
	X	32020	32020					100x125x13 AS	100x125x13 AS	
2803	G - D	23120 E	23120 E					105x130x12 AS		
	C	6026	6026	32311 B	32311 B	32312 B	32312	130x160x15 AS	130x160x15 AS	470x4
	X	32120 E	32120 E					110x130x12 AS		

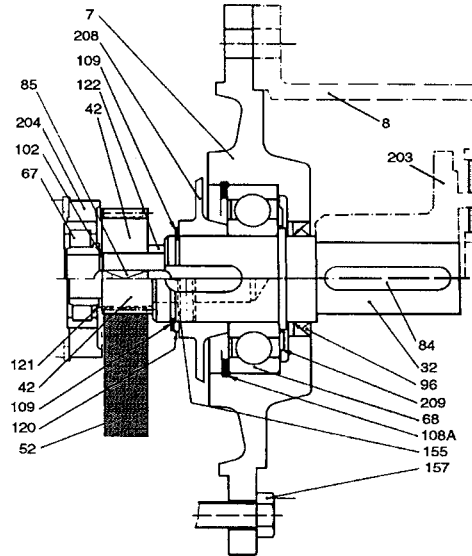


### OtN 27... 28

### C-Face Motor Mounting



**Input Shaft with Backstop**



**Input Shaft Without Backstop**

Part #	Description	Qty.
7	"AP" Input Flange	1
8	C-Face	1
32	Input Shaft	1
42	Pinion	1
52	Wheel	1
67	Bearing (Pinion Side)	1
68	Bearing (Shaft Side)	1
79	Pinion Key	1
84	Shaft Key	1
96	Oil Seal	1
102	Pinion Retaining Ring	1
108A	Retaining Ring	1
109	Retaining Ring	1
120	Ring	1
122	Spacer	1
128	Ring	1
155	Pinion Pin	1

Part #	Description	Qty.
157	Screws	4
203	Coupling (Reducer Half)	1
204	Bearing Ring	1
208	Oil Deflector	1
209	Nilos Bearing Shield	1

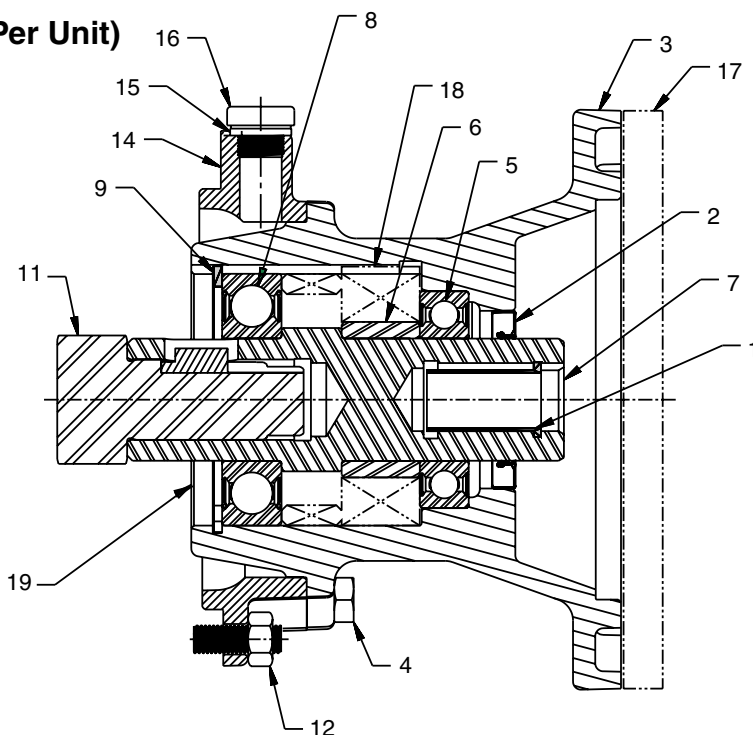
### "AD" Backstop Kit

Part #	Description	Qty.
85	Race Key	1
109A	Retaining Ring	1
110	Retaining Ring	1
158	Flange Screws	4
206	Free Wheel Flange	1
207	Free Wheel	1
211	Oil Deflector	1

### Maintenance Parts

OtN Size	C-Face Input With Coupling			"AP" Input Shaft		
	67	68	96	67	68	96
27	RO w/ratio	6311 RS	55 x 72 x 10 DL	RO w/ratio	6311 RS	55 x 72 x 10 DL
28	RO w/ratio	6313 RS	65 x 90 x 10 DL	RO w/ratio	6313 RS	65 x 90 x 10 DL

OtN 27... 28 (Quantity Per Unit)



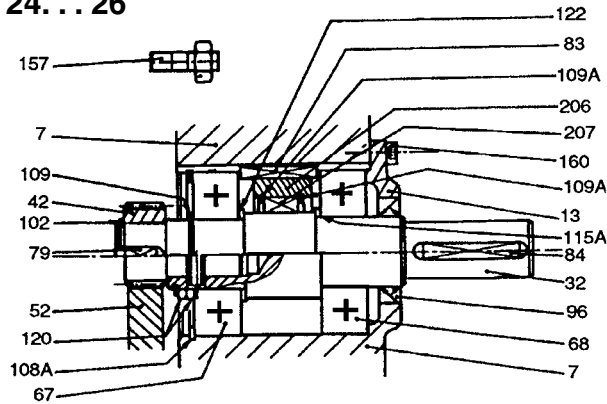
No.	Description	180TC	210TC	250TC	280TC	320TC
1	Non-Metallic Liner	1	1	1	1	1
2	Seal	1	1	1	1	1
3	Motor Adapter	1	1	1	1	1
4	Capscrew	6	6	6	6	6
5	Bearing	1	1	1	1	1
6	Spacer	1	1	1	1	1
7	Input Shaft	1	1	1	1	1
8	Bearing	1	1	1	1	1
9	Internal Snap Ring	1	1	1	1	1
11	Pinion	1	1	1	1	1
12	Bolts	**	**	**	**	**
14	Adapter Flange	1	1	1	1	1
15	Gasket	1	1	1	1	1
16	Plug (1/4")	1	1	1	1	1
17	Motor Adapter Flange	N/A	N/A	N/A	1	N/A
18	Backstop Kit (Option)	1	1	1	1	1
19	Seal	1	1	1	1	1

\*\* Depending on gear frame size: 27 = 4, 28 = 8.

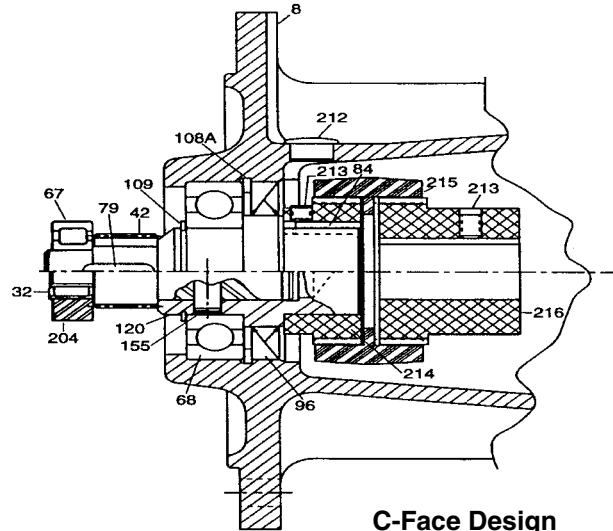
#### Maintenance Parts

Gear Frame	Motor Frame	Bearings		Seal
		5	8	2 (inches)
All	180TC, 210TC	6014 2RS	NJ210	4.438 x 2.625 x .437
All	250TC, 280TC	6014 2RS	NJ210	4.438 x 2.625 x .437
All	320TC	6216 2RS	NJ310	140 x 90 x 12 (mm)

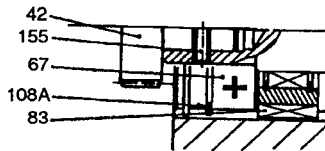
#### OtN 24... 26



Input Shaft - Hollow Pinion



C-Face Design



Input Shaft - Solid Pinion

#### "AP" Input Shaft & "U" C-Face Design Part List

Part #	Description	Qty.
007	"AP" Input Flange	1
008	"U" C-Face Housing	1
032	Input Shaft	1
042	Pinion	1
052	Wheel	1
067	Bearing (Pinion Side)	1
068	Bearing (Shaft Side)	1
079	Pinion Key	1
084	Shaft Key	1
096	Oil Seal	1
102	Pinion Retaining Ring	1
108A	Retaining Ring	1
109	Retaining Ring	1
120	Ring	1

#### "AD" Backstop Kit

Part #	Description	Qty.
122	Spacer	1
128	Ring	1
155	Pinion Pin	1
157	Screws	4
204	Bearing Ring	1
208	Oil Deflector	1
212	Access Plug	1
213	Coupling Set Screw	4
214	Gear Half Coupling (1)	1
215	Flexible Connector (1)	1
216	Motor Half Coupling (1)	1

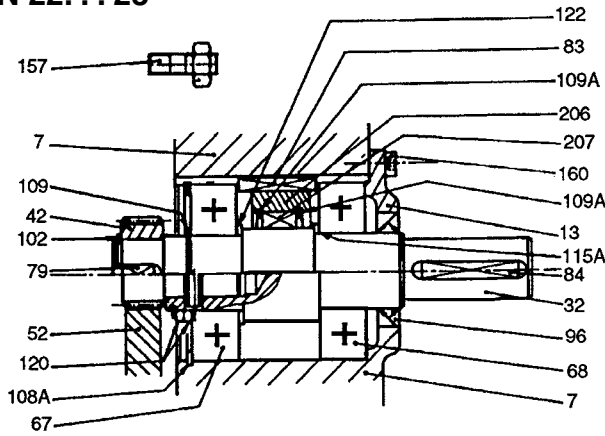
Part #	Description	Qty.
085	Race Key	1
109A	Retaining Ring	1
110	Retaining Ring	1
158	Flange Screws	4
206	Free Wheel Flange	1
207	Free Wheel	1
210	Inner Race	1
211	Oil Deflector	1

(1) Size 26, and 24 or 25 with 250 TC or 284 TC motor use one piece coupling. See Page 6.

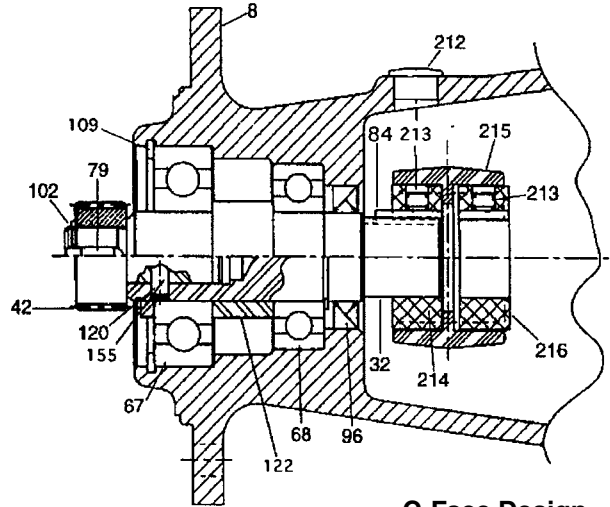
#### Maintenance Parts

Size OtN	"C"-Face Input			"AP" Input Shaft			"AD" Backstop Assembly			
	67	68	96	67	68	96	67	68	96	207
24	NJ 203 E	6207 RS	45x72x8 A	6308 RS	NJ 207 E	35x62x7 A	6308 RS	NJ207 E	35x62x7 A	BWX13244
25	NJ 203 E	6207 RS	45x72x8 A	6308 RS	NJ 207 E	35x62x7 A	6308 RS	NJ207 E	35x62x7 A	BWX13244
26	NA 4900	6207 RS	45x72x8 A	6308 RS	NJ 207 E	35x62x7 A	6308 RS	NJ207 E	35x62x7 A	BWX13244

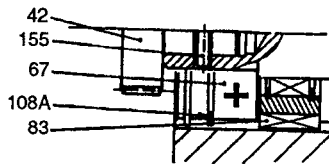
#### OtN 22... 23



**Input Shaft - Hollow Pinion**



**C-Face Design**



**Input Shaft - Solid Pinion**

#### "AP" Input Shaft & "U" C-Face Design Part List

Part #	Description	Qty.
007	"AP" Input Flange	1
008	"U" C-Face Housing	1
032	Input Shaft	1
042	Pinion	1
052	Wheel	1
067	Bearing (Pinion Side)	1
068	Bearing (Shaft Side)	1
079	Pinion Key	1
084	Shaft Key	1
096	Oil Seal	1
102	Pinion Retaining Ring	1
109	Retaining Ring	1
120	Retaining Ring	1

Part #	Description	Qty.
122	Spacer	1
128	Ring	1
155	Pinion Pin	1
157	Screws	4
203	One Piece Coupling (1)	1
204	Bearing Ring	1
208	Oil Deflector	1
212	Access Plug	1
213	Coupling Set Screw	4
214	Gear Half Coupling	1
215	Flexible Connector	1
216	Motor Half Coupling	1

#### "AD" Backstop Kit

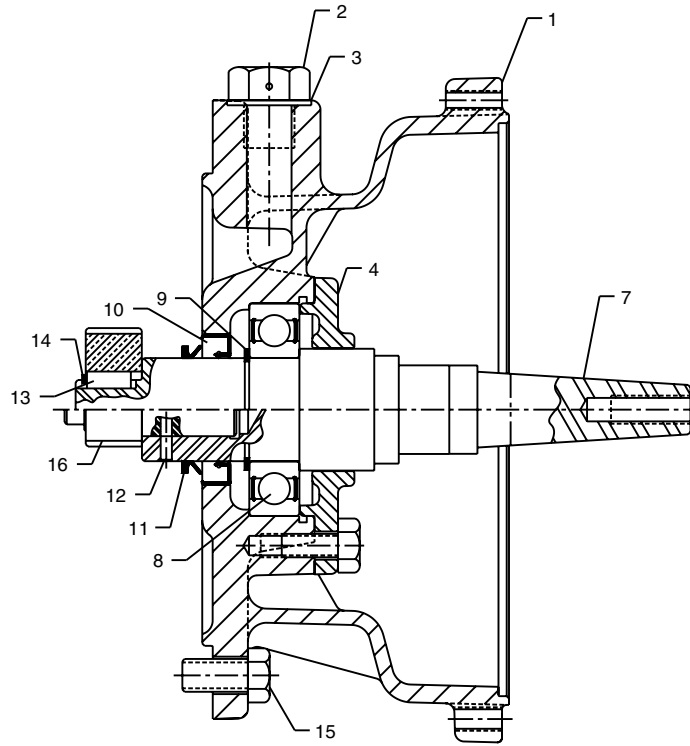
Part #	Description	Qty.
085	Race Key	1
109A	Retaining Ring	1
110	Retaining Ring	1
158	Flange Screws	4
206	Free Wheel Flange	1
207	Free Wheel	1
210	Inner Race	1
211	Oil Deflector	1

(1) Design replaced in 1994 with standard 3-piece design.

#### Maintenance Parts

Size	"C"-Face Input			"AP" Input Shaft			"AD" Backstop Assembly				
	OtN	67	68	96	67	68	96	67	68	96	207
22	6305 RS	6205	25x40x8 AS	6305 RS	6304	20x30x7 AS	6305 RS	6304	20x30x7 AS	BWX133590A	
23	6305 RS	6205	25x40x8 AS	6206 RS	6304	20x30x7 AS	6206 RS	6304	20x30x7 AS	BWX133590A	

OtN 22... 28



#### Gearmotors

#### "Modular" Integral Input Style Parts List

Part #	Description	Qty.
1	"MP" Housing	1
2	Level/Breather Plug	3
3	Plug Seal Washer	3
4TD	Bearing Cap	1
5TD	Socket Head Screw	3
6TD	Ball Bearing	1
4	Bearing Cap *	1
5	Hex Head Screw	4

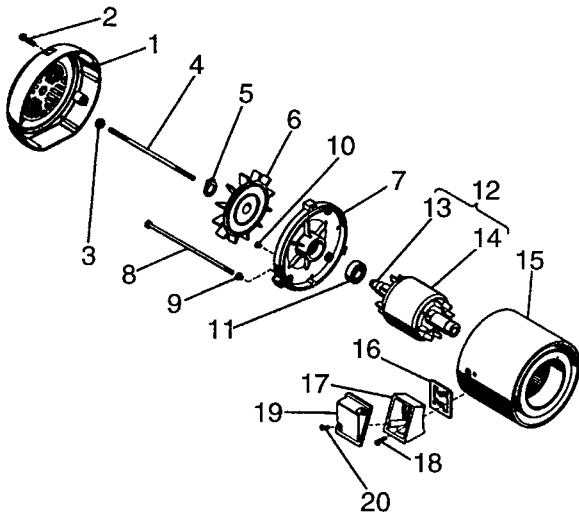
\* Sizes 22-26 standard design converted to snap ring 1/98.

Part #	Description	Qty.
7	Input Shaft	1
8	Ball Bearing	1
9	Retaining Ring	1
10	Oil Seal	1
11	Oil Deflector	1
12	Pinion Pin	1
13	Pinion Key	1
14	Retaining Ring	1
15	Hex Head Screw	4
16	Pinion	1

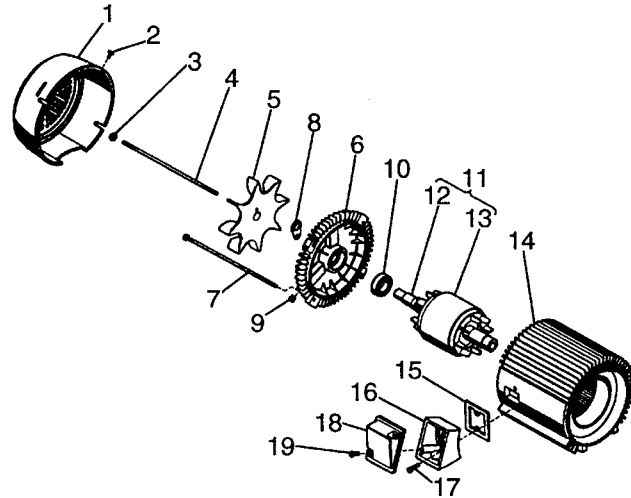
#### Maintenance Parts

OtN Size	Part Number	
	8	10 (inches)
22, 23	6206 2RS	1.156 x 1.878 x .25 Metal OD
24, 25	6207 2RS	1.375 x 2.004 x .375 Metal OD
26, 27	6210 2RS	1.937 x 2.754 x .312 Metal OD
28	6213 Z	2.50 x 3.376 x .375 Metal OD

#### UTP, UTEP, UTIP Integral "Modular" Motor Parts List



Frames 56, 140T



Frames 180T, 210T, 250T, A280T

Part #	Description	Qty.
1	Fan Cover	1
2	Self Tapping Screw	3
3	Hex Nut	1
4	Stud	1
5	Retaining Snap Ring	1
6	Fan	1
7	Bracket	1
8	Screw	4
9	Bushing	4
10	Plastic Plug	4
11	Ball Bearing	1
12	Rotor Assembly (includes items 13 & 14)	1
13	Shaft	1
14	Rotor Core	1
15	Wound Stator Assembly	1
16	Gasket	1
17	Outlet Box Base	1
18	Self Tapping Screw	2
19	Outlet Box Cover	1
20	Self Tapping Screw	2

Part #	Description	Qty.
1	Fan Cover	1
2	Self Tapping Screw	4
3	Hex Nut	1
4	Stud	1
5	Fan	1
6	Bracket	1
7	Hex Head Bolt	4
8	Lifting Lug	1
9	Hex Countersunk Pipe Plug	2
10	Ball Bearing	1
11	Rotor Assembly (includes items 12 & 13)	1
12	Shaft	1
13	Rotor Core	1
14	Wound Stator Assembly	1
15	Gasket	1
16	Outlet Box Base	1
17	Self Tapping Screw	2
18	Outlet Box Cover	1
19	Self Tapping Screw	2



OtN Series 2000

Gearmotors

NOTES:





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