

SECTION C

N - SERIES GEARBOX LUBRICATION

C1.1 N-SERIES GEARBOXES: See data sheet and/or assembly drawing at the front of this manual to find the model number and number of gear reductions for gearbox supplied. Unit case sizes N9 and smaller have been lubricated at the factory with the proper type (for an ambient temperature range of 20° - 104°F; for different ambient conditions, change to appropriate oil shown in Table C1.3) and amount of lubrication for mixer service. To prevent leakage, the gearbox vent has been replaced with a temporary plug for shipment. The vent is included separately.

WARNING: VENT MUST BE REINSTALLED PRIOR TO START-UP OR DAMAGE TO GEARBOX WILL OCCUR. (If gearbox is supplied with OT or OA, see section at end of manual for venting instruction.)

Check that the oil level is to the proper level before start-up (see Figure C1.1), and that none was lost during shipment/installation. Units with an oil tank (OT) or expansion chamber (OA) will require a

lube top off before mixer operation. If an OT or OA is supplied, see section at the end of manual for proper oil level. Change the oil every 10,000 hours or 2 years for mineral lube, 20,000 hours or 4 years with synthetic lube, whichever occurs first. Under extreme conditions it is recommended that the lubricant in the gearbox be changed more frequently. Pipe fittings may be provided to assist in oil draining/filling (see Section C1.2). Refer to Table C1.3 for the lubricant recommended for temperatures in your area. When changing to a different lubricant, clean gearbox with mineral spirits before refilling. Regrease input bearings every 1,000 hours or 6 months, whichever occurs first. See page C-9, Table C2.4 for recommended grease. Open and clean the grease outlet (opposite zirc). Add grease until new grease is forced through the outlet. Remove excess grease. Run one half hour before replacing the grease outlet plugs. Some gearboxes may be supplied with automatic bearing lubricators and will not have a grease fitting on the input. See section C2.3 for more information.

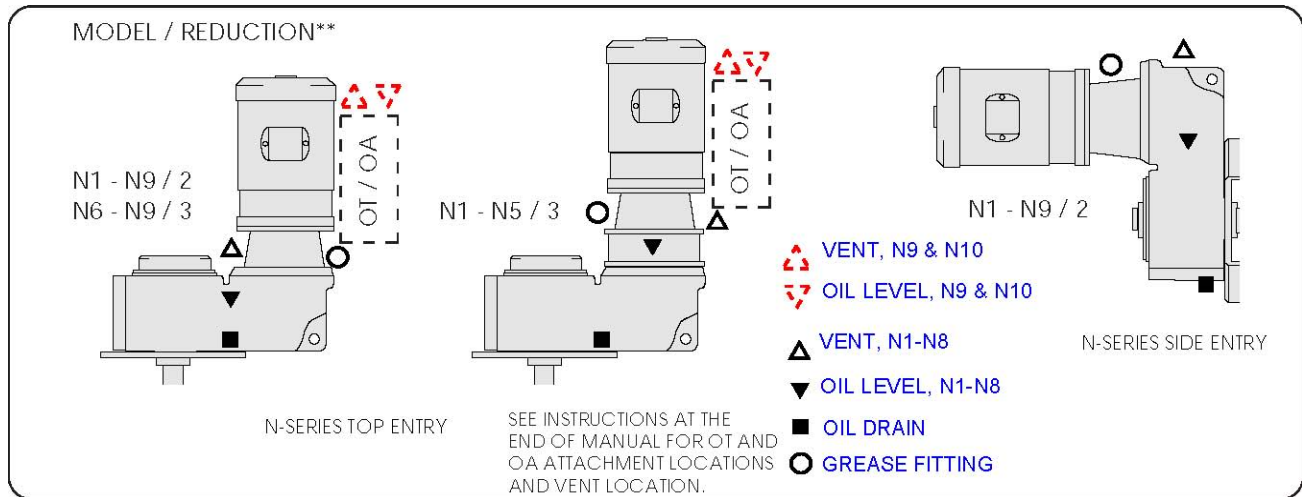


FIGURE C1.1

N-SERIES DOUBLE REDUCTION LUBRICATION CAPACITIES (Qts./LITERS)***

MODEL	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10
SIDE ENTRY	0.95/0.90	1.74/1.65	3.3/3.2	5.0/4.7	7.9/7.5	18.0/17.0	26.4/25.0	39.1/37.0	78.2/74.0	95.1/90.0
TOP ENTRY	1.3/1.2	2.1/2.0	4.3/4.1	5.7/5.4	9.3/8.8	18.5/17.5	28.5/27.0	43.3/41.0	76.1/72.0	95.1/90.0

N-SERIES TRIPLE REDUCTION LUBRICATION CAPACITIES (Qts./LITERS)***

MODEL	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10
TOP ENTRY	2.2/2.1	3.3/3.1	5.9/5.6	8.8/8.3	14.8/14.0	19.0/18.0	26.4/25.0	40.2/38.0	78.2/74.0	105.7/100

IF (OT) OR (OA) IS SUPPLIED, SEE BACK OF MANUAL FOR ADDITIONAL LUBRICATION INFORMATION. TABLE C1.2

*VOLUMES SHOWN ARE AVERAGE VALUES.

**SEE DATA SHEET IN FRONT OF MANUAL FOR NUMBER OF GEAR REDUCTIONS

RECOMMENDED LUBRICANTS FOR HELICAL AND HELICAL-BEVEL GEARBOXES

LUBRICANT CHARACTERISTICS

AMBIENT TEMP. RANGE	20° to 104° F (-5° to +40° C) <i>Factory filled</i>	-5° to +75° F (-21° to +24° C)	-10° to +75° F (-23° to 24° C)	-40° to +50° F (-40° to 10° C)	-13° to 140° F (-25° to 60° C) (synthetic oils)	14° to 176° F (-10° to 80° C) (synthetic oils)	5° - 125° F (-15° to 52° C) Fluid Grease
SSU VISCOSITY at 104° F (40° C)	918 to 1122	626 to 765	417 to 510	67 to 83	100 to 1000	130 to 1112	...
AGMA LUBRICANT NO.	5EP	4EP	3EP	...	...	...	...
ASTM VISCOSITY GRADE	S1000 / C220	S700/C150	S465/C100	...	...	...	...
ISO GRADE	VG220	VG150	VG100	VG15	...	...	...

LUBRICANT MANUFACTURERS

CASTROL	Alpha SP 220 Alpha MW220 Alpha MAX 220 Vitalube GS 220 (food grade)	...	Alpha SP 100 Alpha MW 100 Alpha MAX 100	Hyspin AWS 15 Hyspin SP 15 Hyspin ZZ 15	Isolube EP220	Alphasyn PG 220	Alpha Gel 00
CHEVRON	NL GEAR compound 220 FM ISO 220 (food grade)	NL GEAR compound 150	...	E.P. Hydraulic Oil 22	...	...	...
EXXON/ESSO	Spartan EP 220 Gear Oil FM 220 (food grade)	Spartan EP 150	Spartan EP 100	Univis J13	...	Glycolube 220	...
MOBIL	Mobilgear 630 Mobilgear XMP 220 Mobil DTE FM 220 (food grade)	Mobilgear 629	Mobilgear 627 Mobilgear XMP 110	DTE 11M	Glygoyle HE 680	Mobil SHC 630 Glygoyle HE 220	Mobilux EP023 Mobilith SHC 007 Glygoyle Grease 00
SHELL	Omala EP220 Cassida Fluid GL220 (food grade)	...	Omala EP100	Tellus T 15 Omala HP 32 (synthetic)	Omala HD 220 Tivela S 680	Omala HD 680 Tivela WB Tivela S 220	Tivela Comp. A Tivela GL 00
TEXACO	Meropa 220	Meropa 150	...	Pinnacle EP32 (synthetic)	...	Pinnacle EP680	Multifak HD00 (ISO 680)

TABLE C1.3

FOOD GRADE: SHELL FM ISO 220
SYNTHETIC FOOD GRADE: MOBILE SHC CIBUS 220
ARCTIC SHC 230 OR 234, OILJAX MAGNAPLATE 85W140-FG

C1.2 On units smaller than N9 pipe fittings have been provided to assist in filling and draining gearbox oil. Install these fittings in place of the 1/2" N.P.T. drain in the side of the gearbox (See Figure C1.4).

Refer to table C1.2 for approximate oil quantities for your gearbox size.

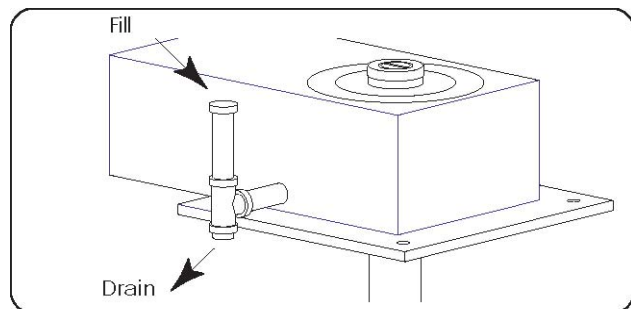
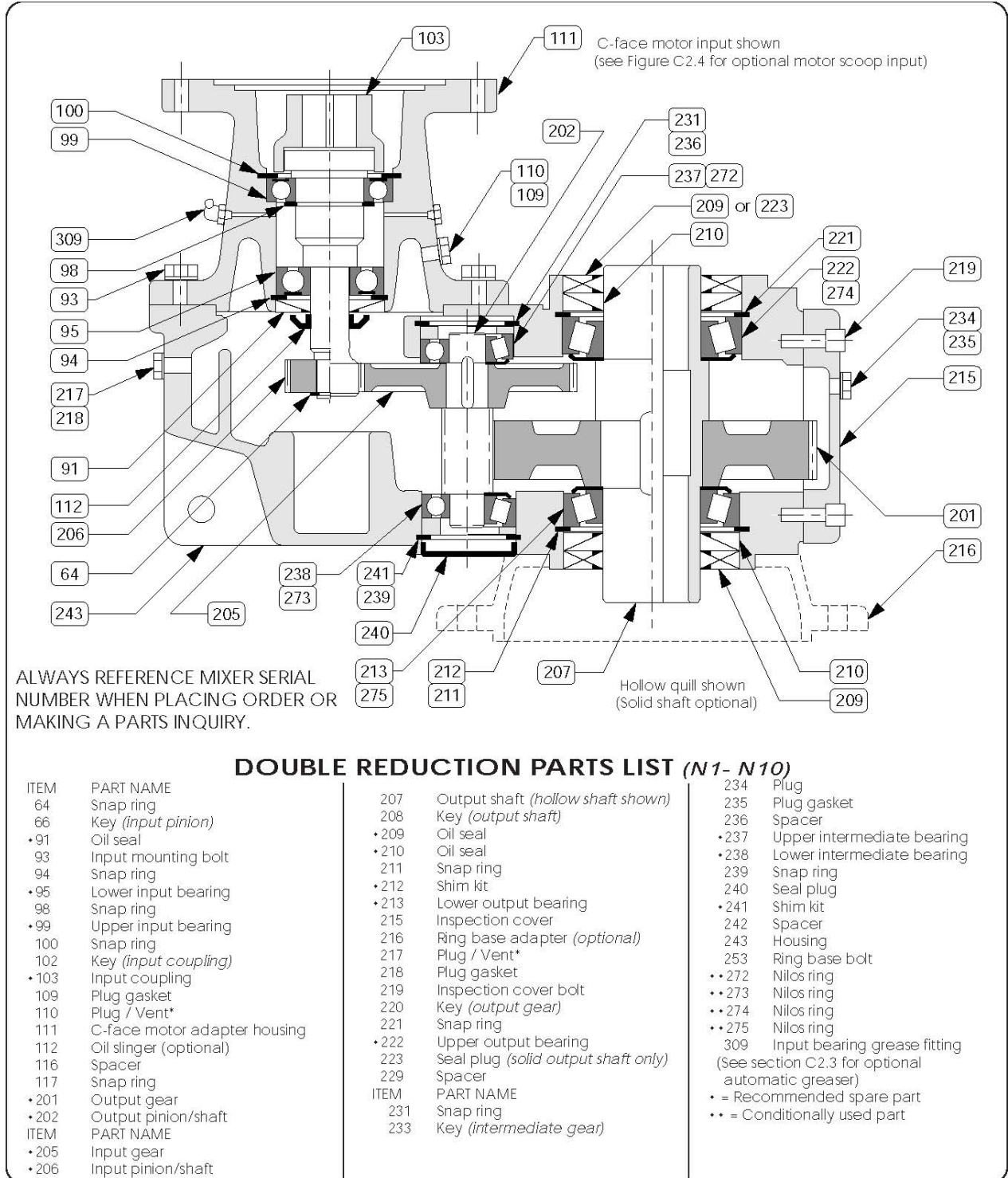


Figure C1.4

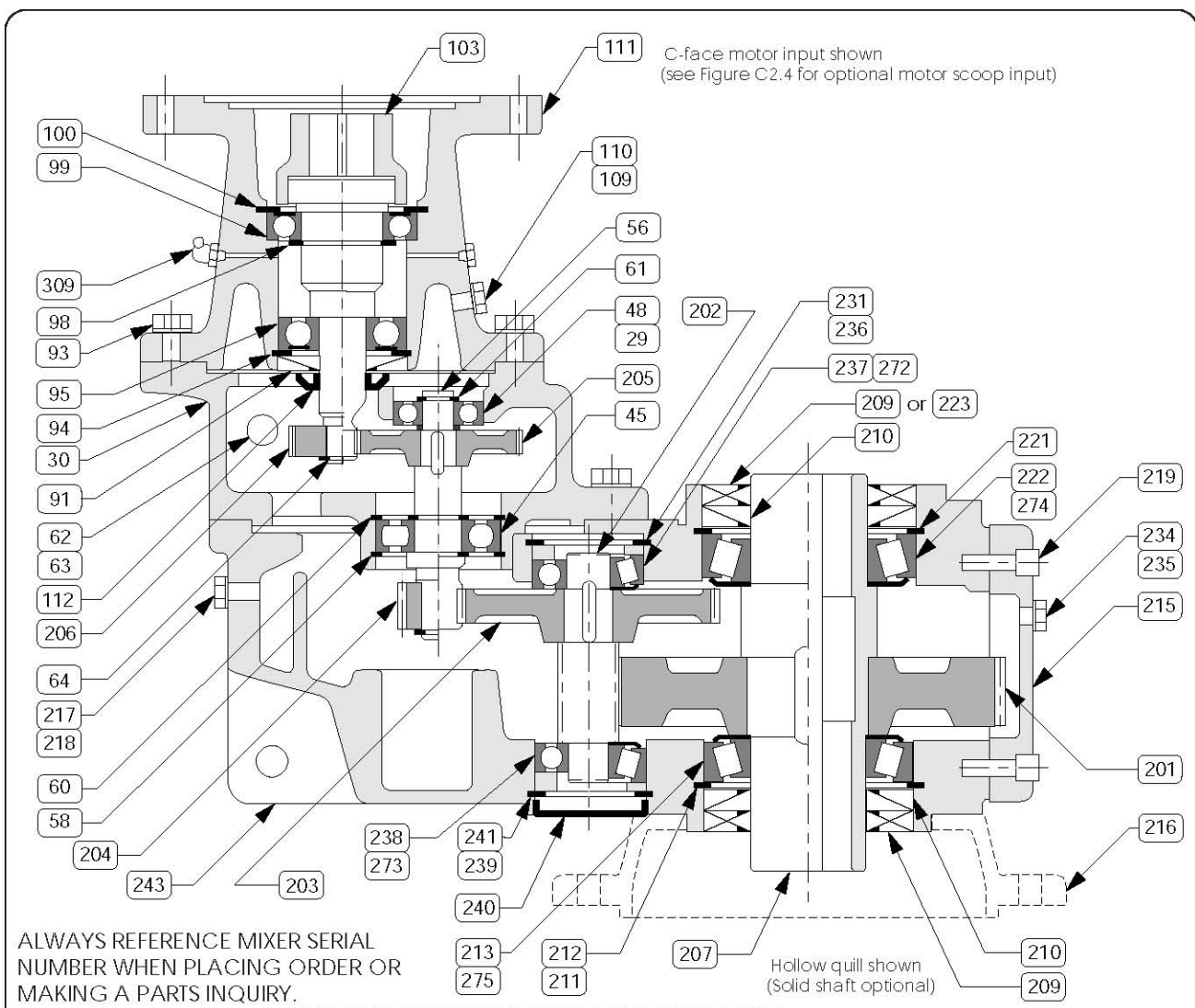
GEARBOX PARTS

C2.1 See data sheet and/or assembly drawing in the front of this manual to find the model number of gearbox supplied. The following drawings (Figures C2.1, C2.2, & C2.3) show standard parts for the N-Series gearbox, your model may vary slightly due to size and ratio. C-face motor adapter is shown in assembly drawings. See page C-8 (Figure C2.4) for

motor scoop input adapter parts. Bearing and seal part numbers are shown on Tables C2.1 and C2.2. When requesting other part numbers, have serial number and model number off mixer nameplate readily available. If disassembling gearbox, contact factory for complete instructions and exact drawing for accurate placement of shims, snap rings, etc.



*See page C1 for proper vent placement



ALWAYS REFERENCE MIXER SERIAL NUMBER WHEN PLACING ORDER OR MAKING A PARTS INQUIRY.

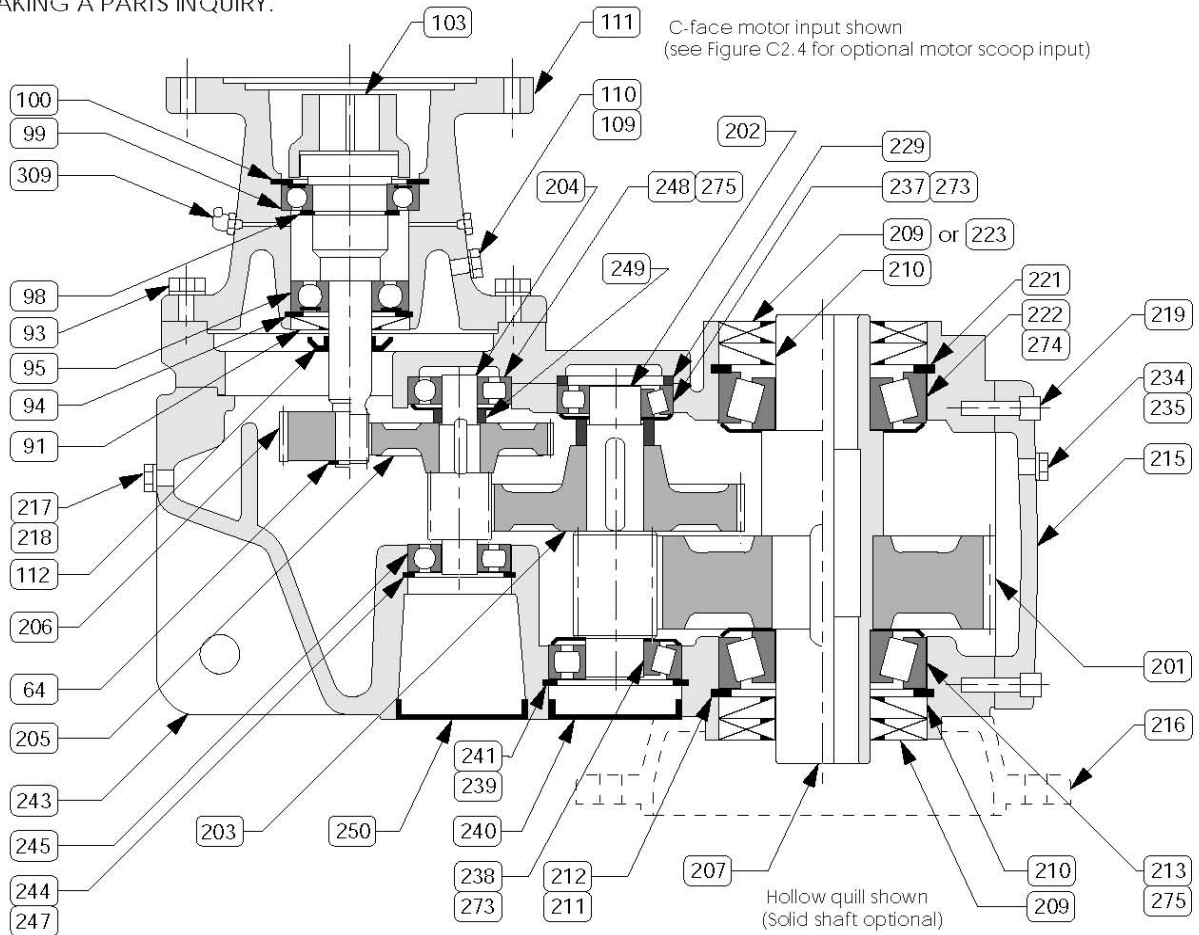
TRIPLE REDUCTION PARTS LIST (N1 - N5)

ITEM	PART NAME	ITEM	PART NAME	ITEM	PART NAME
27	1st stage mounting bolt	102	Key (input coupling)	219	Inspection cover bolt
29	Spacer	• 103	Input coupling	220	Key (output gear)
30	1st stage reduction housing	109	Plug gasket	221	Snap ring
• 45	Lower 1st stage bearing	110	Plug / Vent*	• 222	Upper output bearing
46	Key (1st stage gear)	111	C-face motor adapter housing	223	Seal plug (solid output shaft)
• 48	Upper 1st stage bearing	112	Oil slinger (optional)	229	Spacer
52	Snap ring	116	Spacer	231	Snap ring
53	Key (1st stage pinion)	117	Snap ring	233	Key (second stage gear)
54	Snap ring	• 201	Output gear	234	Plug
56	1st stage reduction shaft	• 202	Output pinion/shaft	235	Plug gasket
57	Snap ring	• 203	Second stage gear	236	Spacer
58	Snap ring	• 204	1st stage pinion	• 237	Upper intermediate bearing
• 59	Shim set	• 205	1st stage gear	• 238	Lower intermediate bearing
60	Snap ring	• 206	Input pinion/shaft	239	Snap ring
61	Snap ring	207	Output shaft	• 240	Seal plug
62	Plug	208	Key (output shaft)	• 241	Shim kit
63	Plug gasket	• 209	Oil seal	242	Spacer
64	Snap ring	• 210	Oil seal	243	Housing
66	Key (input pinion)	211	Snap ring	253	Ring base bolt
• 91	Oil seal	• 212	Shim kit	•• 272	Nilos ring
93	Input mounting bolt	• 213	Lower output bearing	•• 273	Nilos ring
• 95	Lower input bearing	215	Inspection cover	•• 274	Nilos ring
98	Snap ring	216	Ring base adapter (optional)	•• 275	Nilos ring
• 99	Upper input bearing	217	Plug / Vent	•• 309	Input bearing grease fitting
100	Snap ring	218	Plug gasket		

*See page C1 for proper vent placement

FIGURE C2.2

ALWAYS REFERENCE MIXER SERIAL NUMBER WHEN PLACING ORDER OR MAKING A PARTS INQUIRY.



TRIPLE REDUCTION PARTS LIST (N6 - N10)

ITEM	PART NAME	ITEM	PART NAME	ITEM	PART NAME
64	Snap ring	211	Snap ring	243	Housing
66	Key (input pinion)	212	Shim kit	244	Snap ring
•91	Oil seal	•213	Lower output bearing	•245	Lower 1st stage bearing
93	Input mounting bolt	215	Inspection cover	•247	Shim kit
•95	Lower input bearing	216	Ring base adapter (optional)	•248	Upper 1st stage bearing
98	Snap ring	217	Plug / Vent*	249	Spacer
•99	Upper input bearing	218	Plug gasket	253	Ring base bolt
100	Snap ring	219	Inspection cover bolt	•250	Seal plug
102	Key (input coupling)	220	Key (output gear)	••271	Nilosring
•103	Input coupling	221	Snap ring	••272	Nilosring
109	Plug gasket	•222	Upper output bearing	••273	Nilosring
110	Plug / Vent*	•223	Seal plug (solid output shaft only)	••274	Nilosring
111	C-face motor adapter housing	227	Input cover bolt	••275	Nilosring
112	Oil slinger (optional)	229	Spacer	309	Input bearing grease fitting
116	Spacer	230	Input cover	(See section C2.3 for optional automatic greaser)	
117	Snap ring	233	Key (second stage gear)	• = Recommended spare part	
•201	Output gear	234	Plug	•• = Conditionally used part	
•202	Second stage pinion shaft	235	Plug gasket		
•203	Second stage gear	236	Spacer		
•204	First stage pinion shaft	•237	Upper 2nd stage bearing		
•205	First stage input gear	•238	Lower 2nd stage bearing		
•206	Input pinion/shaft	239	Snap ring		
207	Output shaft	•240	Seal plug		
208	Key (output shaft)	•241	Shim kit		
•209	Oil seal	242	Spacer		
•210	Oil seal				

*See page C1 for proper vent placement

FIGURE C2.3

DOUBLE REDUCTION INPUT BEARINGS AND SEALS

Contact factory for all other parts.

ITEM	C-Face Inputs							Foot Motors	
	POS.	56C	140TC	180TC	210TC	250TC	280TC	POS.	MTR SCOOP
N1									160S
Oil seal	91	20x52x10A	20x52x10A					67	20x47x7A
Lower bearing	95	6304-Z	6304-Z					71	6204-Z
Upper bearing	99	6007-Z	6007-Z					75	6204-Z
N2									250S
Oil seal	91	30x72x10A	30x72x10A	30x72x10A	40x90x12A			67	30x72x10A
Lower bearing	95	6306-Z	6306-Z	6306-Z	6308-Z			71	6306-Z
Upper bearing	99	6007-Z	6007-Z	6208-Z	6211-Z			75	6306-Z
N3									250S
Oil seal	91	30x72x10A	30x72x10A	30x72x10A	40x90x12A			67	30x72x10A
Lower bearing	95	6306-Z	6306-Z	6306-Z	6308-Z			71	6306-Z
Upper bearing	99	6007-Z	6007-Z	6208-Z	6211-Z			75	6306-Z
N4									300S
Oil seal	91	30x72x10A	30x72x10A	<i>see factory</i>	50x80x10A	55x85x10A		67	40x100x10A
Lower bearing	95	6306-Z	6306-Z	<i>see factory</i>	6310-Z	6311-Z		71	6309-Z
Upper bearing	99	6207-Z	6207-Z	<i>see factory</i>	6311-Z	6312-Z		75	6308-Z
N5									300S
Oil seal	91	30x72x10A	30x72x10A	<i>see factory</i>	50x80x10A	55x85x10A		67	60x100x12A
Lower bearing	95	6306-Z	6306-Z	<i>see factory</i>	6310-Z	6311-Z		71	6309-Z
Upper bearing	99	6207-Z	6207-Z	<i>see factory</i>	6311-Z	6312-Z		75	6308-Z
N6									DIA 250
Oil seal	91			50x80x10A	50x80x10A	75x115x13A	75x115x13A	67	65x120x10A
Lower bearing	95			6310-Z	6310-Z	NU215mm	NU215mm	71	NU311E
Upper bearing	99			6311-Z	6311-Z	3216-Z	3216-Z	75	6311-Z
N7									DIA 250
Oil seal	91			50x80x10A	50x80x10A	75x115x13A	75x115x13A	67	65x120x10A
Lower bearing	95			6310-Z	6310-Z	NU215mm	NU215mm	71	NU311E
Upper bearing	99			6311-Z	6311-Z	3216-Z	3216-Z	75	6311-Z
N8									DIA 250
Oil seal	91			50x80x10A	50x80x10A	75x115x13A	75x115x13A	67	65x120x10A
Lower bearing	95			6310-Z	6310-Z	NU215mm	NU215mm	71	NU311E
Upper bearing	99			6311-Z	6311-Z	3216-Z	3216-Z	75	6311-Z
N9									
Oil seal	91			50x80x10A	50x80x10A	75x115x13A	75x115x13A	67	Ratio
Lower bearing	95			6310-Z	6310-Z	NU215mm	NU215mm	71	Dependant
Upper bearing	99			6311-Z	6311-Z	6216-Z	6216-Z	75	<i>see factory</i>
N10									
Oil seal	91	CONTACT FACTORY FOR N10 BEARINGS AND SEALS						67	Ratio
Lower bearing	95	CONTACT FACTORY FOR N10 BEARINGS AND SEALS						71	Dependant
Upper bearing	99	CONTACT FACTORY FOR N10 BEARINGS AND SEALS						75	<i>see factory</i>

TABLE C2.1

C2.2 Input bearings are shielded on one side only. When replacing bearings, be sure to install them with the shield facing away from the grease fitting on the input cylinder. NOTE: GEARBOXES SHIPPED BEFORE 1995 MAY REQUIRE DOUBLE SEALED BEARINGS ON THE INPUT. PLEASE CONSULT THE FACTORY TO VERIFY.

CAUTION: DO NOT DISASSEMBLE GEARBOX WITHOUT PRIOR AUTHORIZATION FROM SHARPE MIXERS OR WARRANTY WILL BE VOID. (DISREGARD WHEN MIXER IS OUT OF WARRANTY PERIOD.)

TRIPLE REDUCTION INPUT BEARINGS AND SEALS

Contact factory for all other parts.

ITEM	C-Face Inputs							Foot Motors	
	POS.	56C	140TC	180TC	210TC	250TC	280TC	POS.	MTR SCOOP
N1									
Oil seal	91	20x52x10A	20x52x10A					67	160S 20x47x7A
Lower bearing	95	6304-Z	6304-Z					71	6204-Z
Upper bearing	99	6007-Z	6007-Z					75	6204-Z
N2									
Oil seal	91	20x52x10A	20x52x10A					67	160S 20x47x7A
Lower bearing	95	6304-Z	6304-Z					71	6204-Z
Upper bearing	99	6007-Z	6007-Z					75	6204-Z
N3									
Oil seal	91	20x52x10A	30x72x10A					67	160S 20x47x7A
Lower bearing	95	6304-Z	6304-Z					71	6204-Z
Upper bearing	99	6007-Z	6007-Z					75	6204-Z
N4									
Oil seal	91	30x72x10A	30x72x10A	<i>see factory</i>	40x90x12A			67	250S 30x72x10A
Lower bearing	95	6306-Z	6306-Z	<i>see factory</i>	6308-Z			71	6306-Z
Upper bearing	99	6007-Z	6007-Z	<i>see factory</i>	6211-Z			75	6306-Z
N5									
Oil seal	91	30x72x10A	30x72x10A	<i>see factory</i>	40x90x12A			67	250S 30x72x10A
Lower bearing	95	6306-Z	6306-Z	<i>see factory</i>	6308-Z			71	6306-Z
Upper bearing	99	6007-Z	6007-Z	<i>see factory</i>	6211-Z			75	6306-Z
N6									
Oil seal	91	30x72x10A	30x72x10A	<i>see factory</i>	50x80x10A	55x85x10A		67	300S 60x100x12A
Lower bearing	95	6306-Z	6306-Z	<i>see factory</i>	6310-Z	6311-Z		71	6309-Z
Upper bearing	99	6207-Z	6207-Z	<i>see factory</i>	6311-Z	6312-Z		75	6308-Z
N7									
Oil seal	91			50x80x10A	50x80x10A	75x115x13A	75x115x13A	67	DIA 250 65x120x10A
Lower bearing	95			6310-Z	6310-Z	NU215mm	NU215mm	71	NU311E
Upper bearing	99			6311-Z	6311-Z	3216-Z	3216-Z	75	6311-Z
N8									
Oil seal	91			50x80x10A	50x80x10A	75x115x13A	75x115x13A	67	DIA 250 65x120x10A
Lower bearing	95			6310-Z	6310-Z	NU215mm	NU215mm	71	NU311E
Upper bearing	99			6311-Z	6311-Z	3216-Z	3216-Z	75	6311-Z
N9									
Oil seal	91			50x80x10A	50x80x10A	75x115x13A	75x115x13A	67	Ratio
Lower bearing	95			6310-Z	6310-Z	NU215mm	NU215mm	71	Dependant
Upper bearing	99			6311-Z	6311-Z	3216-Z	6216-Z	75	<i>see factory</i>
N10									
Oil seal	91	CONTACT FACTORY FOR N10 BEARINGS AND SEALS						67	Ratio
Lower bearing	95							71	Dependant
Upper bearing	99							75	<i>see factory</i>

TABLE C2.2

ALWAYS REFERENCE THE MIXER SERIAL NUMBER WHEN PLACING ORDER OR MAKING PARTS INQUIRY. THIS SERIAL NUMBER IS LOCATED ON THE **SHARPE MIXER** NAMEPLATE & ON THE FRONT COVER OF THE SERVICE MANUAL.

GEARBOX BEARINGS AND SEALS

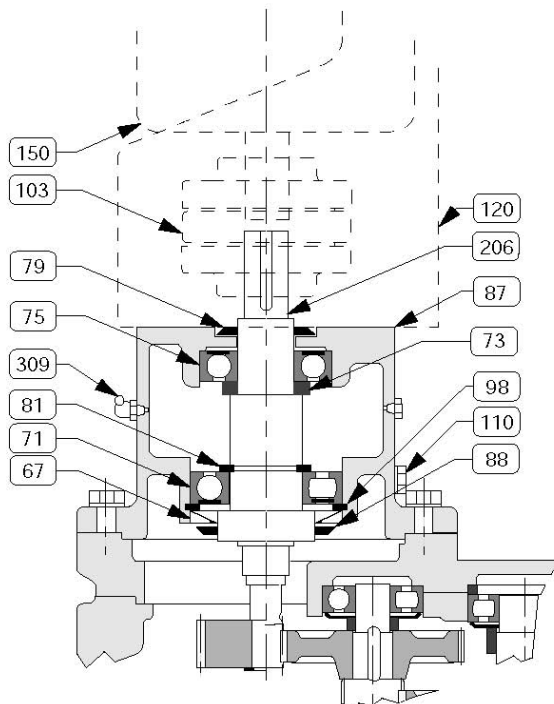
Contact factory for all other parts.

GEARBOX	OIL SEALS	BEARINGS		
MODEL/ REDUCTION	LOW SPEED Pos. Nos. 209/210	INTERMEDIATE Pos. Nos. 245/248 or 45/48	INTERMEDIATE Pos. Nos. 237/238	LOW SPEED Pos. Nos. 213/222
N1 / 2	45x75x7AS/45x75x7A		6302/6302-2Z	32009/32009
N1 / 3	45x75x7AS/45x75x7A	<i>contact factory</i>	6302/6302-2Z	32009/32009
N2 / 2	50x90x8AS/50x90x10A		6303TMB/6303TMB	30210/30210
N2 / 3	50x90x8AS/50x90x10A	<i>contact factory</i>	6303TMB/6303TMB	30210/30210
N3 / 2	55x100x10AS/55x100x10A		30304/32304	30211/30211
N3 / 3	55x100x10AS/55x100x10A	<i>contact factory</i>	30304/32304	30211/30211
N4 / 2	70x125x12AS/70x125x12A		32305/32305	30214/30214
N4 / 3	70x125x12AS/70x125x12A	NUP305E/TMB303	32305/32305	30214/30214
N5 / 2	85x150x12AS/85x150x12A		30306/32306	30217/30217
N5 / 3	85x150x12AS/85x150x12A	NUP307E/NUP304E	30306/32306	30217/30217
N6 / 2	100x180x12AS/100x180x12A		NJ407/22308E	30220/30220
N6 / 3	100x180x12AS/100x180x12A	NJ306E/6404	NJ407/22308E	30220/30220
N7 / 2	110x200x13AS/110x200x13A		32308/32309	30222/30222
N7 / 3	110x200x13AS/110x200x13A	NJ307E/6405	31308E/32309	30222/30222
N8 / 2	130x230x14AS/130x230x14A		32309/32310	30226/30226
N8 / 3	130x230x14AS/130x230x14A	NJ309E/6407	31309/32310	30226/30226
N9 / 2	160x290x18AS/160x290x18A		22311E/22314E	30232/30232
N9 / 3	160x290x18AS/160x290x18A	22308E/22308E	22311E/22314E	30232/30232
N10 / 2	CONTACT FACTORY FOR N10 BEARINGS AND SEALS			
N10 / 3	CONTACT FACTORY FOR N10 BEARINGS AND SEALS			

TABLE C2.3

MOTOR SCOOP INPUT PARTS LIST (ALL SIZES)

Alternate to C-face input assembly shown in
Gearbox assemblies, Figures C2.1 through C2.3



ITEM	PART NAME
•67	Oil seal
•71	Lower input bearing
73	Spacer
•75	Upper input bearing
79	Oil slinger
81	Snap ring
87	Input cylinder
88	Oil slinger
98	Snap ring
•103	Input coupling
110	Plug / Vent
120	Motor scoop
150	Motor
•206	Input shaft / pinion
309	Input bearing grease fitting

• = Recommended spare part

FIGURE C2.4

C2.3 The input bearings requires relubrication at regular intervals. To lubricate the bearings of the input shaft, add about 0.75 oz of grease every 1,000 hours or 6 months, whichever occurs first. See C1.1 for instructions and table C2.4 for recommended bearing greases. Automatic lubricators are available on request.

The optional automatic lubricators feed grease lubricant to the outboard adapter bearing continuously over time. The lubricator contains 4 oz. (120 cc) of grease. **Each automatic lubricator must be activated by turning the plastic eyelet into the canister until the eyelet breaks off.** This pressurizes the canister and releases grease. With 8 hours/day of operation it must be replaced every 12 months. For longer operating times the replacement interval decreases accordingly.

The automatic lubricator is designed for normal service conditions at ambient temperatures between 32°F (0°C) and 104°F (40°C). If the ambient temperature is outside this range for prolonged periods of time, special lubricants should be used. Consult factory. A canister with food grade lubricant is also available.

C2.4 When replacing output bearings and seals on the gearbox be sure to re-pack bearings and seals with grease (see figure C2.6). See table C2.4 for recommended grease options.

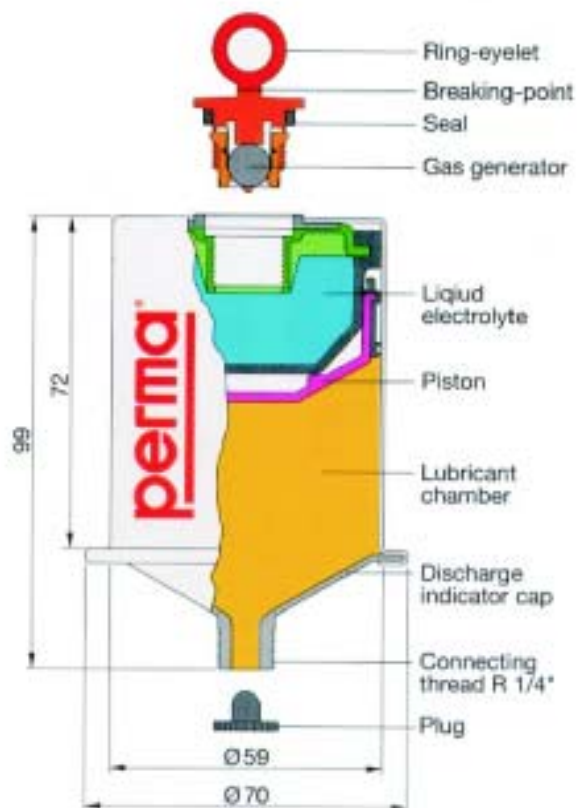


FIGURE C2.5
(dimensions in mm)

Grease Options (applied to greased bearings and seal cavities)

NLGI Grade	Grease Type/Thickener	Ambient Temperature Range	Manufacturer Brand/Type
NLGI 2	Standard/Li-Complex	-22 to 140 deg F (-30 to 60 deg C)	Shell Albida EP 2
	High-Temperature/Polyurea	-13 to 176 deg F (-25 to 80 deg C)	Mobil Polyrex EP 2
	Food-Grade/Al-Complex	-13 to 104 deg F (-25 to 104 deg C)	Mobil Grease FM222

TABLE C2.4

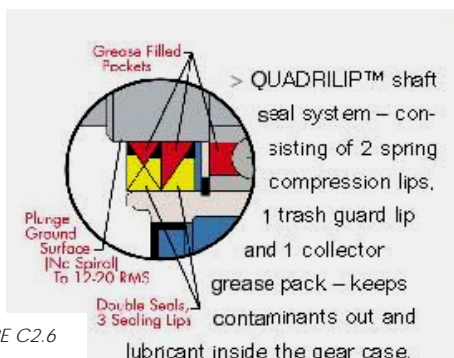


FIGURE C2.6

Notes: _____

