GEARBOX PARTS MANUAL

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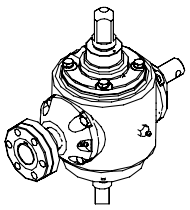
P-12183
REV K
03/09/2023

Shivvers offers the following systems using the Gearboxes shown in this Parts Manual, tailored to fit individual drying needs.

Circu-lator JR: This is an economy Continuous Flow Drying system that does not include a Horizontal Unload Auger. Instead, the Drive motor is installed on top of the Center Vertical Auger inside the bin. Its Gearbox is a single section, Circu-lator I style unit that does not extend below the Drying Floor. It has only one Tapered Sweep Auger, but can accommodate an Auxiliary Sweep Auger for end of season cleanout. Also, as the name implies, it can re-circulate the grain within the bin.

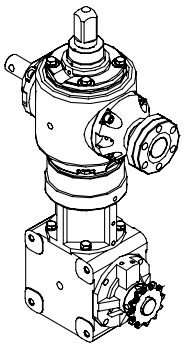
Circ JR Gearboxes are only available with regular temperature oil seals and grease.



Circ Jr

Circu-lator I: Used mainly in smaller dryer bins 18-27 ft. in diameter, this unit is driven from outside of the bin at ground level by a solid drive shaft inside the Horizontal Unload Auger. Its Gearbox is a dual section unit that has only one Tapered Sweep Auger attached, but like the Circ JR, it can accommodate an Auxiliary Sweep Auger for end of season cleanout. Additionally, with its Center Vertical Auger driven by the Gearbox's square top shaft, it can re-circulate the grain within the bin and its Horizontal Unload Auger can remove grain from the center of the bin.

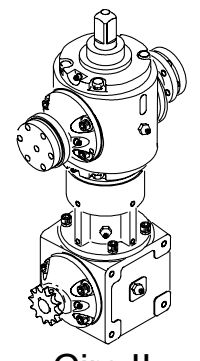
Circ I Gearboxes are only available with regular temperature oil seals and grease.



Circ I

Circu-lator II: By far our most popular drying system and offered in our Performance Systems, this unit is used primarily in 27-42 ft. bins. Its gearbox is a dual section unit that provides outputs for two Tapered Sweep Augers. As with the Circulator I, its Center Vertical Auger, driven by the Gearbox's square top shaft, can re-circulate the grain within the bin and its Horizontal Unload Auger can remove grain from the center of the bin.

Circ II Gearboxes are available with regular temperature or high temperature oil seals and grease.



Circ II

Dri Flo 500 & 1000: Designed for continous flow drying only, these systems do not have Center Vertical Augers and cannot re-circulate the grain within the drying bin. Current units have been fitted with Circulator II gearboxes. Since Dri Flo 500 and 1000 use Circulator II Gearboxes, they provide outputs for two Tapered Sweep Augers as well, and the Horizontal Unload Auger is used not just for unloading the bin but for transferring the dry grain during continuous flow drying.
Circulator II & Dri Flo 500 and 1000 drying systems currently use the same gearboxes: 428G-001A for regular temperature drying (up to 180°F) and 428E-001A for high temperature drying (up to 200° F). The 428E-001A is assembled with Silicon oil seals and a high temperature grease.

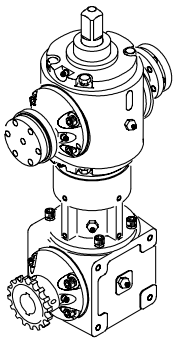
Dri-Flo is characterized as having NO CENTER VERTICAL auger, but rather a bonnet covering the gearbox. Replacement parts must be Identified and ordered by calling the factory.

Dri-Flo 500 & 1000:
Three current production models use two Tapered Sweeps:
Dri-Flo 500 w/ 6" Horizontal Unload
Dri-Flo 500 w/ 8" Horizontal Unload
Dri-Flo 1000 w/ 8" Horizontal Unload

Dri Flo 1500: (Designed to work with our HTDK). Designed for continous flow drying only, these systems do not have Center Vertical Augers and cannot re-circulate the grain within the drying bin. Dri Flo 1500 uses Circulator III Gearboxes, which provide outputs for three Tapered Sweep Augers as well, and the 8" Horizontal Unload Auger is used not just for unloading the bin but for transferring the dry grain during continuous flow drying.
Dri Flo 1500 drying systems use 3-Sweep gearboxes, 428P-001A, prior to 2016, (for 42' and under bins, with 3/8-16 threads in the flange and 708 series sweeps) or 428R-001A (with 7/16-20 threads in the flange and 712 series sweeps). These gearboxes are for high temperature drying (up to 200° and are assembled with Silicon oil seals and a high temperature grease.

HTDK (High Torque Drive Kit): Similar to the Circu-lator II system, this unit is designed to handle higher capacities of grain and larger bins (36-48 ft). This system uses a dual electric motor powerhead, a stronger Horizontal Unload Auger, and our Wide Spread Center Vertical Auger.
Requiring higher startup torques, its High Torque Gearbox, has been upgraded. It is a dual section unit that provides outputs for two or three larger capacity Tapered Sweep Augers.

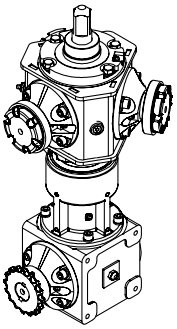
As with the Circu-lator II, the High Torque Drives' Wide Spread Center Vertical Auger, Driven by the gearbox's square top shaft, can re-circulate the grain within the bin. Also, as the name indicates, The Wide Spread Center Vertical can distribute the grain more evenly in the larger bin sizes. The High Torque Drives' Horizontal Unload Auger, is used primarily to remove grain from the center of the bin.


Hi Torque

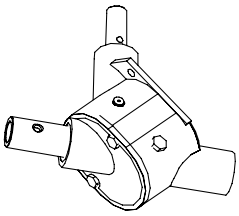
The 3-Sweep High Torque Gearbox is also used with the HCCV (High Capacity Center Vertical) Auger and is designed to handle the flow from 3 Sweep augers.

Note: High Torque Gearboxes used wth a High Torque Drive Auger are driven with a 16-Tooth chain coupler, and cannot be installed in an existing Circulator system using a Non-High Torque Drive Unload Auger.
High Torque Gearboxes are only available with high temperature oil Seals and Grease.

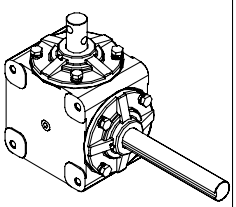
NOTE: The HCCV (High Capacity Center Vertical) Auger has a larger intake than the WSCV (15" instead of 13"), allowing it to handle more bushels per hour.


3-Sweep

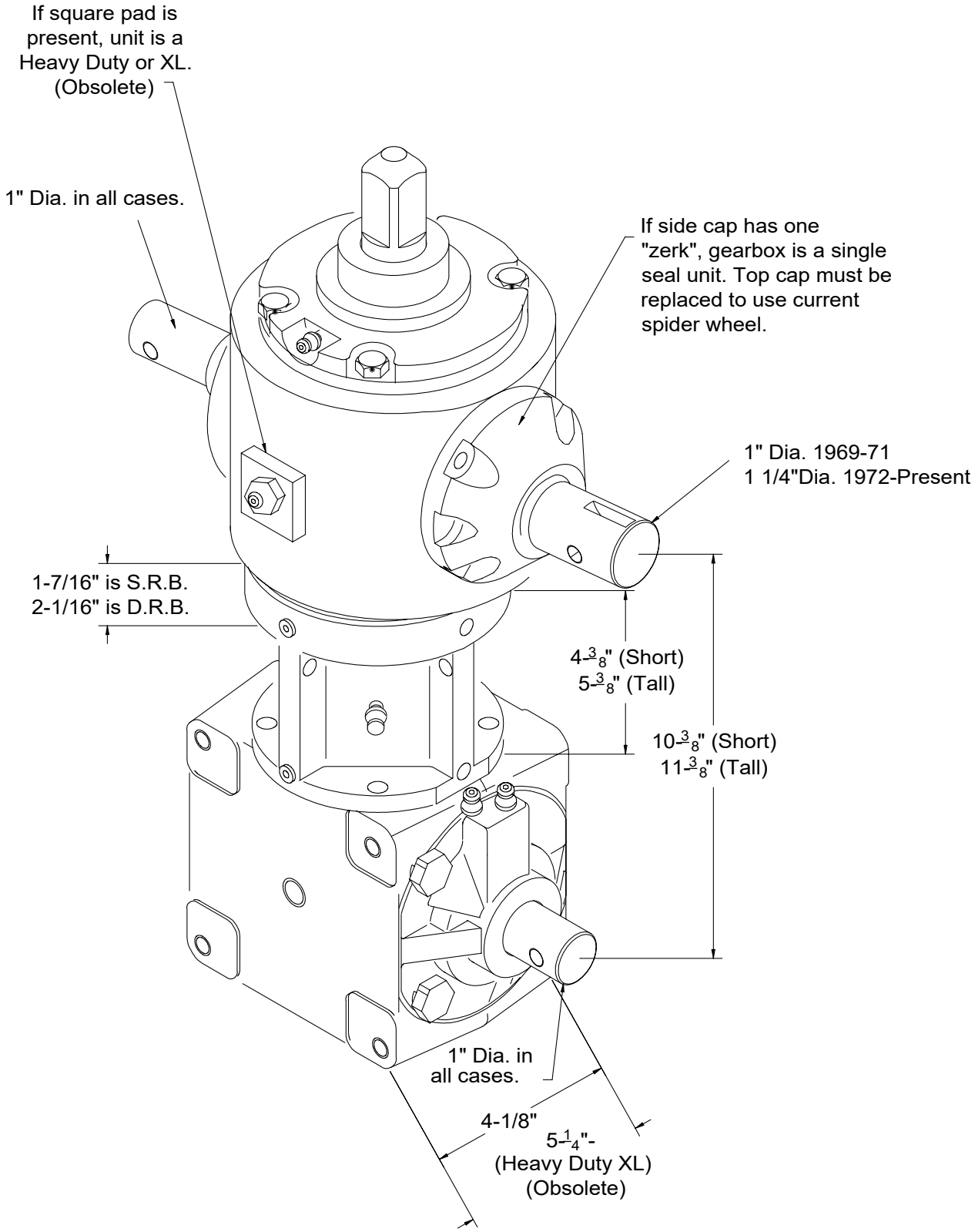
Auxiliary Sweep Gearbox: Circu-lator JR and Circu-lator I systems are made so they will accept a carry-in Auxiliary Sweep Auger to clean out the bin at the end of season. These Sweep Augers include an aluminum housing, right angle gearbox that fits onto the Circu-lator Gearbox cross shaft opposite the tapered sweep.


Aux. Sweep

Vertical Unload Gearbox: Circu-lator I & Circu-lator II can be fitted with a Vertical Unload Auger attached to their horizontal unload transitions. These units take their power through the gearboxes from the motors that drive the entire system. For systems that have a higher demand for power from their system motor, Shivvers offers a top drive style Vertical Unload that has its own dedicated motor and no gearbox. Systems on larger bins or those using High Torque power heads are among these.

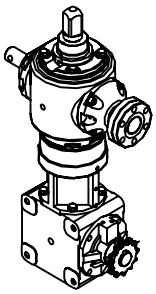

Vert. Unld.

CIRCU-LATOR I GEARBOX IDENTIFICATION

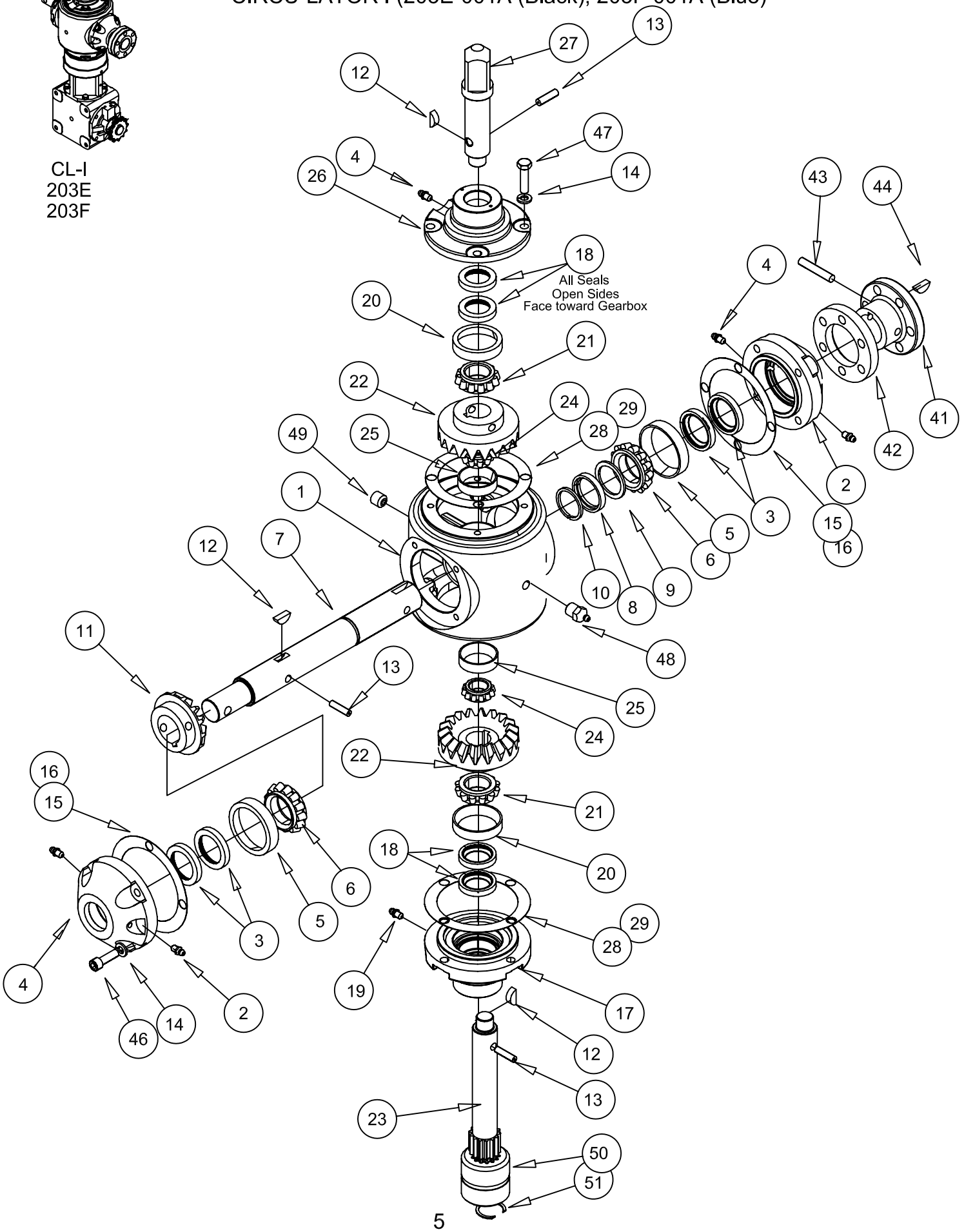


TOP HOUSING ASSEMBLY-203-057A

CIRCU-LATOR I (203E-001A (Black), 203F-001A (Blue)

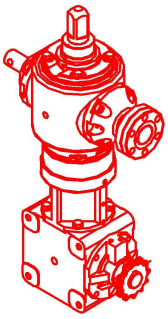


CL-I
203E
203F



TOP HOUSING ASSEMBLY-203-057A

CIRCU-LATOR I (203E-001A (Black), 203F-001A (Blue)



CL-I
203E
203F

Item:	Description:	Qty	Part No.	
1	HOUSING, TOP	1	203-012P	
2	Cap, Side	2	203-017P	
3	Seal, 1-1/4" ID:CR-12364	4	D-7001-03	
4	Grease Fitting: ALE# 3038-B	5	H-1056	
5	Bearing Cup: LM67010	2	D-2014-01	
6	Bearing Cone: LM67048	2	D-2013-01	
7	Shaft, Cross: 11.375"	1	203-018P	Assembly, 203-006A
8	Collar	1	203-002P	
9	Washer	1	F-8001-01	
10	Snap Ring: Eaton# 336-2	1	F-1033-01	
11	Gear, Pinion: 14 Teeth	1	D-3025	
12	Key, Woodruff: 1/4 x 3/4"	3	D-1004-02	
13	Roll Pin: 5/16 x 2"	3	F-1036-39	
14	L'Washer: 5/16" Heavy Spring	16	F-1019-02	
15	Shim: 3.938" Dia. x .005"	AR	H-1351	
16	Shim: 3.938" Dia. x .015"	AR	H-1352	
17	Bottom Cap, Circ-1	1	203-020P	
18	Seal, 1" ID: (Nitrile) CR# 9878	4	D-7001-07	
19	Grease Fitting: ALE# 1607-B	1	H-1010-07	
20	Bearing Cup: L44610	2	D-2019-01	
21	Bearing Cone: L44643	2	D-2018-01	
22	Gear: 19 Teeth	2	D-3024	
23	Shaft, Bottom: Spline, 4.951"	1	203-050P	
24	Bearing Cone: LM11749	2	D-2016-01	
25	Bearing Cup: LM11710	2	D-2017-01	
26	Top Cap, Circ-1	1	203-014P	
27	Shaft, Top: Circ-1	1	203-015P	
28	Shim: 4.250" Dia. x .005"	AR	H-1066	
29	Shim: 4.250" Dia. x .015"	AR	H-1067	
46	SHCS: 5/16-18 x 1", GR8, Blk	8	F-1048-15	
47	HHCS: 5/16-18 x 1", GR5, Ny	8	F-1110	
48	Grease Fitting: ALE# 1627-B	1	H-1010-02	
49	Pipe, Plug: 1/4-18 NPT	1	H-1025-01	
	Lubricant: Grease, Moly-Lithium Extreme Pressure #2 only (14 oz. tube)	AR	C-6185	Napa-Valv #633

AR= As Required

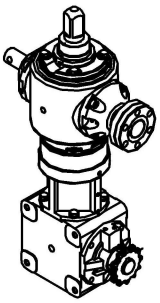
Reference---Related Assemblies

				Assemblies
2	Cap, Side	1	203-017P	
3	Seal, 1-1/4" ID Nitrile	2	D-7001-03	Assy: 203-016A
4	Grease Fitting: ALE# 3038-B Bearing Cup:	2	H-1056	
5	LM67010	1	D-2014-01	
26	Cap, Top	1	203-014P	
18	Seal, 1" ID	2	D-7001-07	
4	Grease Fitting: ALE# 3038-B Bearing Cup:	1	H-1056	Assy: 203-034A
20	LM67010	1	D-2019-01	
17	Cap, Bottom	1	203-020P	
18	Seal, 1" ID	2	D-7001-07	Assy: 203-035A
19	Grease Fitting: ALE# 3038-B Bearing Cup:	1	H-1010-07	
20	LM67010	1	D-2019-01	
41	Base	1	203Z-032P	
42	Flange	1	203Z-033P	Kit:: 423-022-001A
43	Rollpin	1	F-1036-37	
44	Key, Woodruff: 1/4 x 1	1	D-1004-01	
50	Coupler, Splined	1	203-054P	
51	Snap Ring, Internal:Eaton NAN112	1	H-2551	Kit:: 203-059A

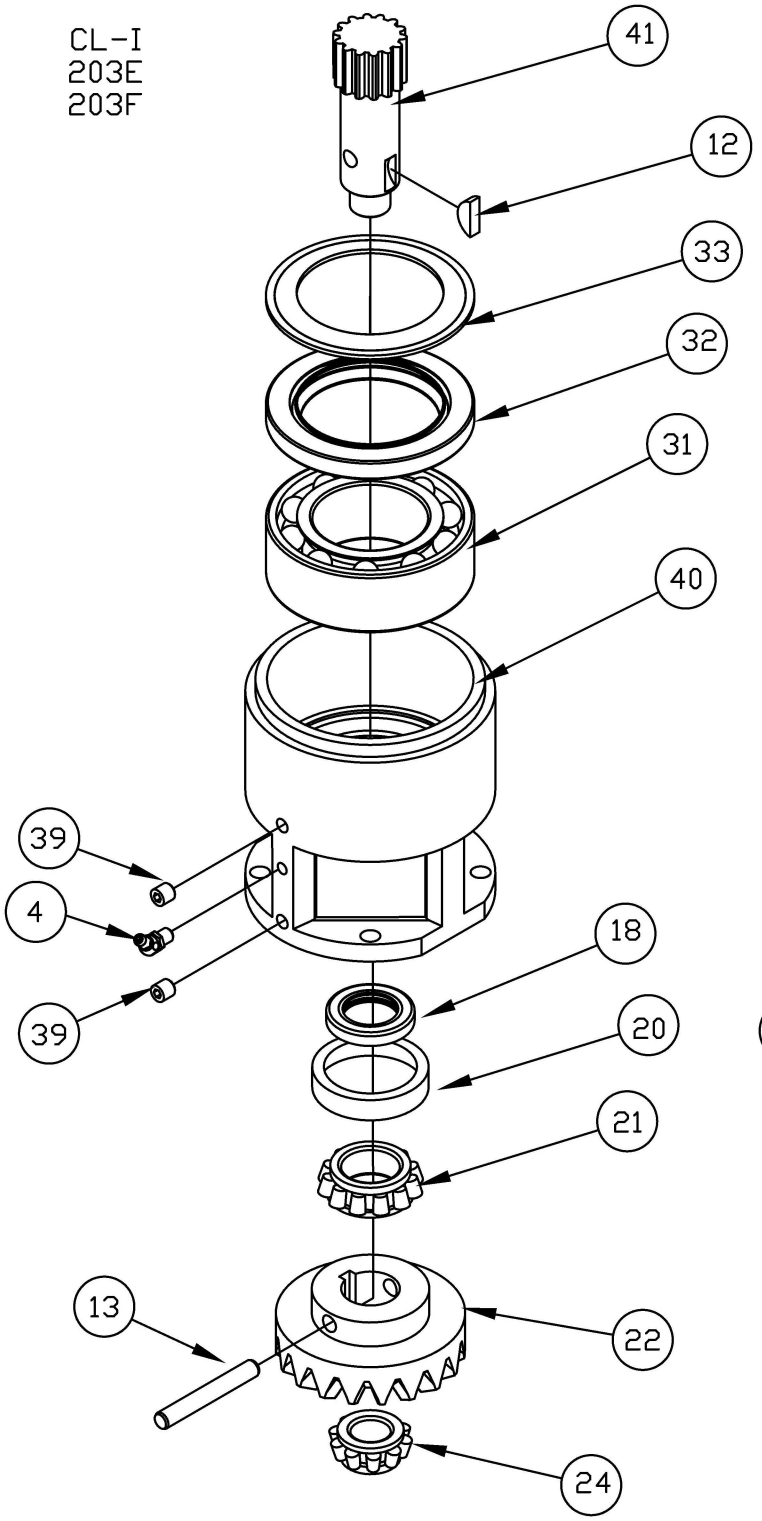
**Must be used with Double-Row Bearing only. See "Center Housing" Note.

CENTER HOUSING ASSEMBLY

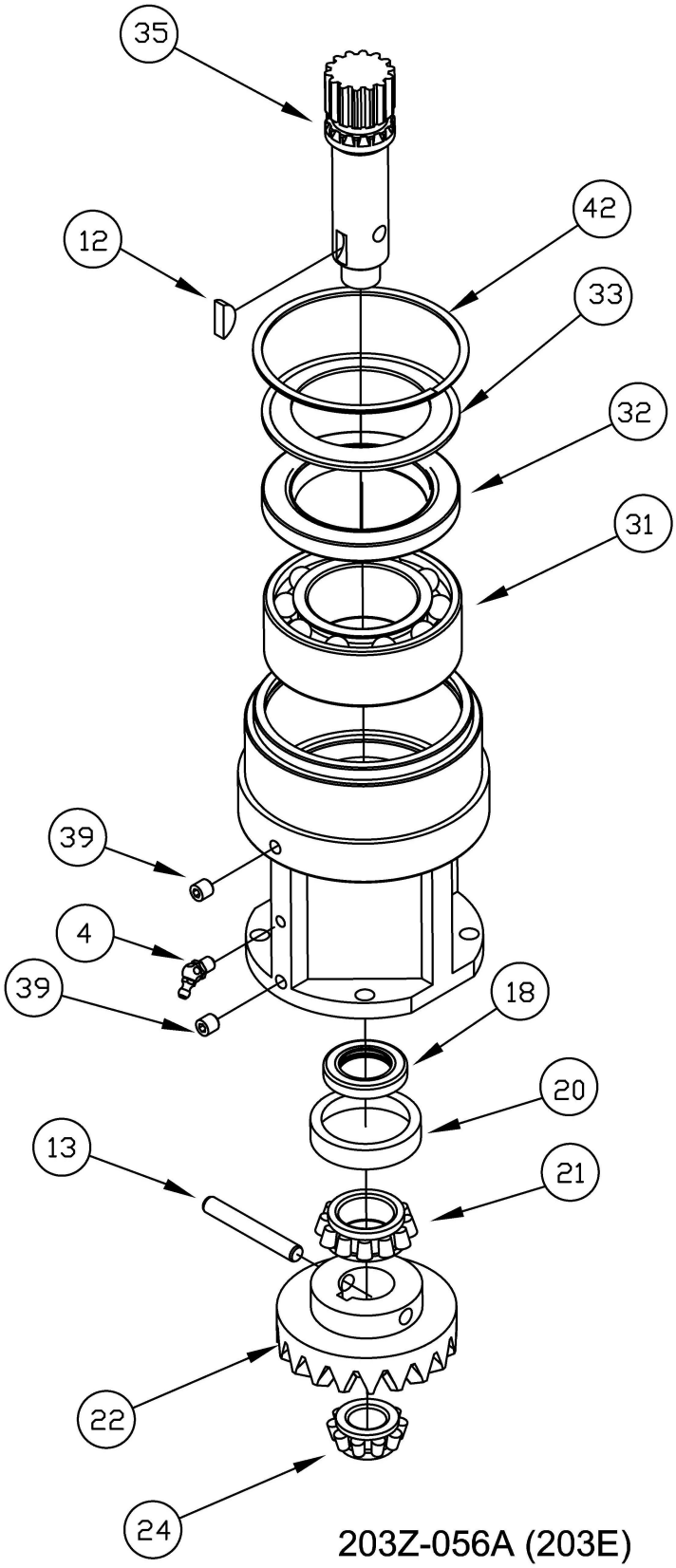
CIRCU-LATOR I (203E-001A (Black) 203F-001A (Blue)



CL-I
203E
203F



203Z-055A (203F)
(SHORT Center housing)



203Z-056A (203E)
(TALL Center Housing)

CENTER HOUSING ASSEMBLY

CIRCU-LATOR I (203E-001A, 203F-001A)

CL-I
203E
203F

203Z-056A-(203E-001A) (TALL)
203Z-055A-(203F-001A) (SHORT)

Item:	Description:	Qty.	Part No.	Special Notes:
30	CENTER HOUSING	1	203Z-024P	*Tall Center Section 5.375" High.
40	CENTER HOUSING		203Z-023P	*Short Center Section 4.375" High.
31	Bearing, DRB 5210W	1	D-3033	**(Single Row=D-2015-01
32	Seal, Oil, 2.375 x .375W	1	D-7001-08	
33	Protector Washer	1	203-025P	
18	Seal, 1"ID CR9878	1	D-7001-07	
20	Bearing Cup, 1.980 L44610	1	D-2019-01	
21	Bearing Cone L44643	1	D-2018-01	
22	Gear, 19 Tooth	1	D-3024	
12	Key, Woodruff: 1/4 x 3/4"	1	D-1004-02	
13	Roll Pin, Dbl, 5/16 x 2"	1	F-1036-39	
4	Zerk, 45°, 1/4 NPT	1	H-1300	
35	Shaft, Splined (for TALL), 4.576"L	1	203-052P	203Z-056A (203E)
41	Shaft, Splined (for SHORT), 3.576"L	1	203-051P	203Z-055A (203F)
24	Bearing Cone, LM11749	1	D-2016-01	
39	Pipe Plug, 1/16"	2	H-1025-02	
42	Ring, Internal Retaining, 3.54"	1	F-1884	
	Capscrew, 5/16 x 1" (Shown but not part	4	F-1110	
	Lockwasher, 5/16" of the Assembly)	2	F-1019-02	
	Lubricant: Grease, Moly-Lithium Extreme Pressure #2 only (14 oz. tube)	AR	C-6185	Napa-Valv #633

AR= As Required

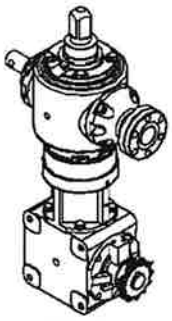
NOTE:

See Splined Shaft Kits for 203Z-055A and 203Z-056A on page 38.

**Before ordering a center section Bearing, measure the Center Housing (see page on 'Circu-Lator I Gearbox Identification') to determine whether you have a Double Row Bearing (DRB) or a Single Row Bearing (SRB).

Single Row Bearing center sections are no longer available. If a SRB center section needs replaced, the bottom cap of the top gearbox must also be replaced. By the same token, if a bottom cap of a top gearbox is replaced, the center section must be a Double Row Bearing unit.

These parts will not directly interchange without the likelihood of a failure at a later time.



CL-I
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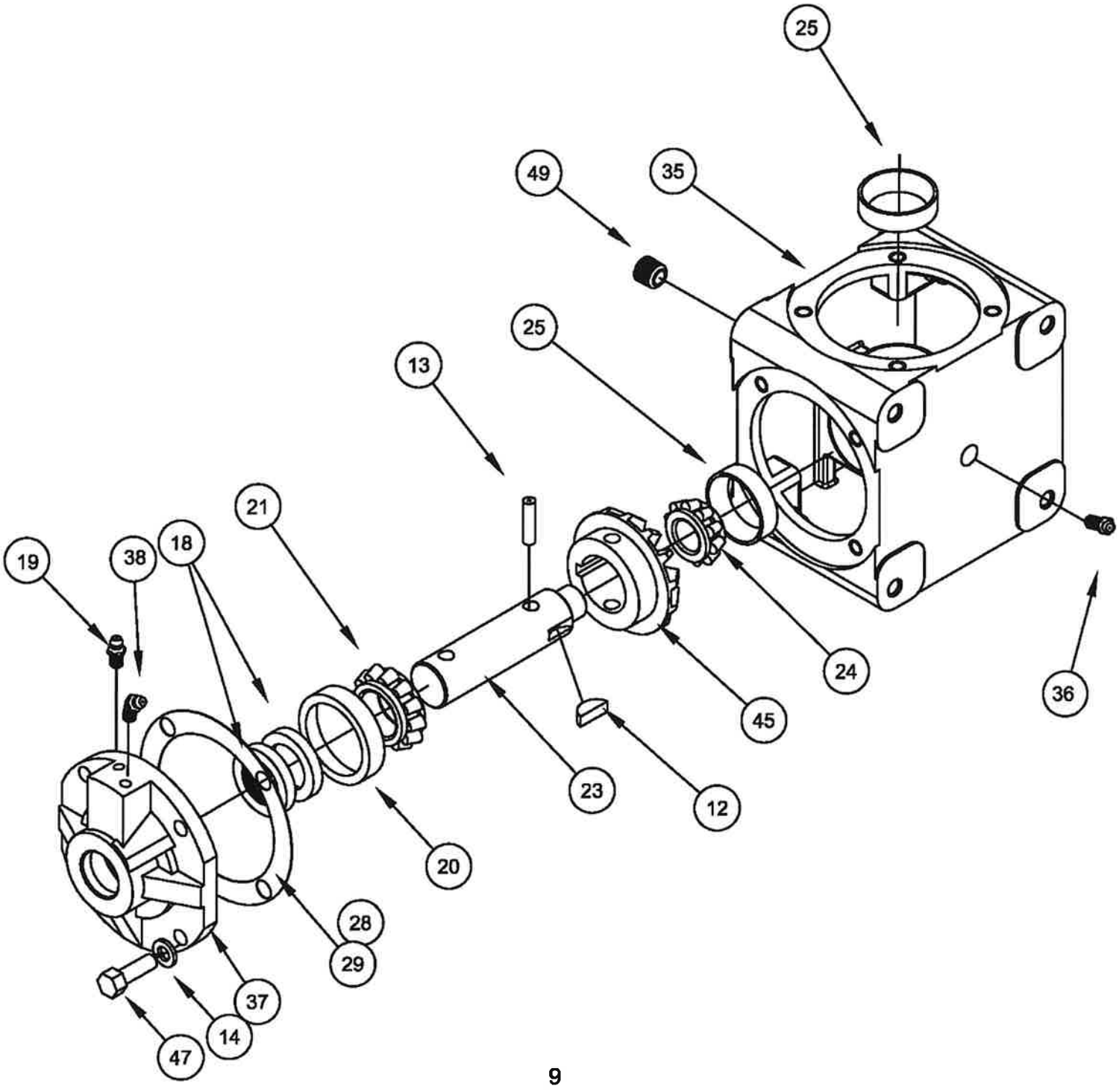
BOTTOM HOUSING ASSEMBLY 203-011A

CIRCU-LATOR I (203E-001A (Black), 203F-001A (Blue)



BOTTOM HOUSING ASSEMBLY 203-011A

CIRCU-LATOR (203E-001A (Black), 203F-001A (Blue)

CL-I
203E
203F

Item:	Description:	Qty.	Part No.	
35	HOUSING, BOTTOM	1	203-028P	
25	Bearing Cup: LM11710	1	D-2017-01	
36	Grease Zerk 1/4 NPT, 67°	1	H-1010-04	
49	Pipe, Plug: 1/4-18 NPT	1	H-1025-01	
28	Shim: .005"	AR	H-1066	
29	Shim: .015"	AR	H-1067	
47	Capscrews, HHCS, 5/16-18 x 1"	8	F-1110	
14	Lock Washer, 5/16	8	F-1019-02	
				Assemblies
37	Cap, End	1	203-030P	Assy: 203-042A,
18	Seal, 1" ID: CR9878	2	D-7001-07	
19	Grease Zerk, Straight, 1/4-28	1	H-1010-05	
38	Grease Zerk, 45° 1/4 NPT	1	H-1300	
20	Bearing Cup: L44610	1	D-2019-01	
21	Bearing Cone: L44643	1	D-2018-01	Assy: 203-029A,
23	Shaft, Input (4.125" lg)	1	203-031P	
45	Gear: 14 Teeth	1	D-3023	
13	Roll Pin: Double, 5/16 x 2"	1	F-1036-39	
12	Key, Woodruff: 1/4 x 3/4"	1	D-1004-02	
24	Bearing Cone: LM11749	1	D-2016-01	
	Lubricant: Grease, Moly-Lithium Extreme Pressure #2 only (14 oz. tube)	AR	C-6185	Napa-Valv #633

AR= As Required

All parts are used in Both the Tall (5.375" center section, formerly called 8"), and the Short (4.375" center section, formerly called 6"), except where otherwise noted.

Complete Gearboxes are available to replace either size.

TOP HOUSING ASSEMBLY 428-063A

CIRCU-LATOR II OR DRI-FLO (428G-001A) (Blue)

CL-II or DF
428G

All Seals
Open Sides Face
toward Gearbox

Shown But Not Included
In This Assembly
(Must be ordered Separately)

TOP HOUSING ASSEMBLY 428-063A

CIRCU-LATOR II OR DRI-FLO--428G-001A (Blue)

CL-II or DF
428G

Item:	Description:	Qty.	Part No.
1	HOUSING, TOP	1	428-003P
2	Cap, Side	2	428-005P
3	Seal, 1-1/4" ID: (Nitrile) CR-12364	8	D-7001-03
4	Grease Fitting: ALE# 3038-B	6	H-1056
5	Bearing Cup: LM67010	4	D-2014-01
6	Bearing Cone: LM67048	4	D-2013-01
7	Shaft, output, 1 Pc. with Base	2	428-062P
8	Gear, Pinion: 17 Teeth	2	D-3028
9	Roll Pin: 1/4 x 2"	3	F-1036-29
10	Key, Woodruff: 1/4 x 3/4"	3	D-1004-02
11	Bearing Cone: M12649	2	D-2012-01
12	Bearing Cup: M12610	2	D-2011-01
13	Shaft, Main: 13" (Splined)	1	428-028P
14	Gear: 23 Teeth	1	D-3027
15	Snap Ring: Eaton# 336-2	1	F-1033-01
16	Collar	1	203-002P
17	Washer	1	F-8001-01
20	Cap, Top	1	428-009P
21	Cap, Bottom	1	428-012P
22	Shim 5.500" Dia. x .005"	AR	H-1069
23	Shim: 5.500" Dia. x .015"	AR	H-1071
25	L'Washer: 3/8" Heavy Spring	16	F-1019-03
35	Grease Fitting: ALE# 1627-B	1	H-1010-02
36	Pipe, Plug: 1/4-18 NPT	1	H-1025-01
37	Shim: 4.500" Dia. x .005"	AR	H-1073
38	Shim: 4.500" Dia. x .015"	AR	H-1075
39	SHCS: 3/8-16 x 1-1/4", GR8, Blk	8	F-1170
40	Flange	2	208-029P
45	HHCS: 3/8-16 x 1.25", GR5, Ny	8	F-1032-01
46	O-Ring	2	D-3771

REFERENCE--RELATED ASSEMBLIES

				Assemblies
2	Cap, Side	1	428-005P	Assy: 428-004A
3	Seal, 1-1/4" ID: (Nitrile) CR-12364	2	D-7001-03	
4	Grease Fitting: ALE# 3038-B	2	H-1056	
5	Bearing Cup: LM67010	1	D-2014-01	
20	Cap, Top	1	428-009P	Assy: 428-008A
3	Seal, 1-1/4" ID: (Nitrile) CR-12364	2	D-7001-03	
4	Grease Fitting: ALE# 3038-B	1	H-1056	
5	Bearing Cup: LM67010	1	D-2014-01	
21	Cap, Bottom	1	428-012P	Assy: 428-011A
3	Seal, 1-1/4" ID: CR-12364	2	D-7001-03	
4	Grease Fitting: ALE# 3038-B	1	H-1056	
5	Bearing Cup: LM67010	1	D-2014-01	
13	Shaft, Main: 13" (Splined)	1	428-028P	Kit: 423-312-001A
19	Coupler, Splined	1	203-054P	203-059A
18	Snap Ring, Internal: Eaton # NAN112	1	H-2551	
30A	Shaft, Splined	1	428-030P	

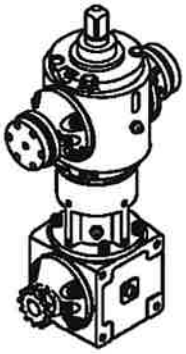
NOTE: See pg. 41 for Output Shaft Replacement Kit.

NA	Lubricant: Grease, Moly-Lithium Extreme Pressure #2 only	AR	C-6185	NAPA-VALV #633

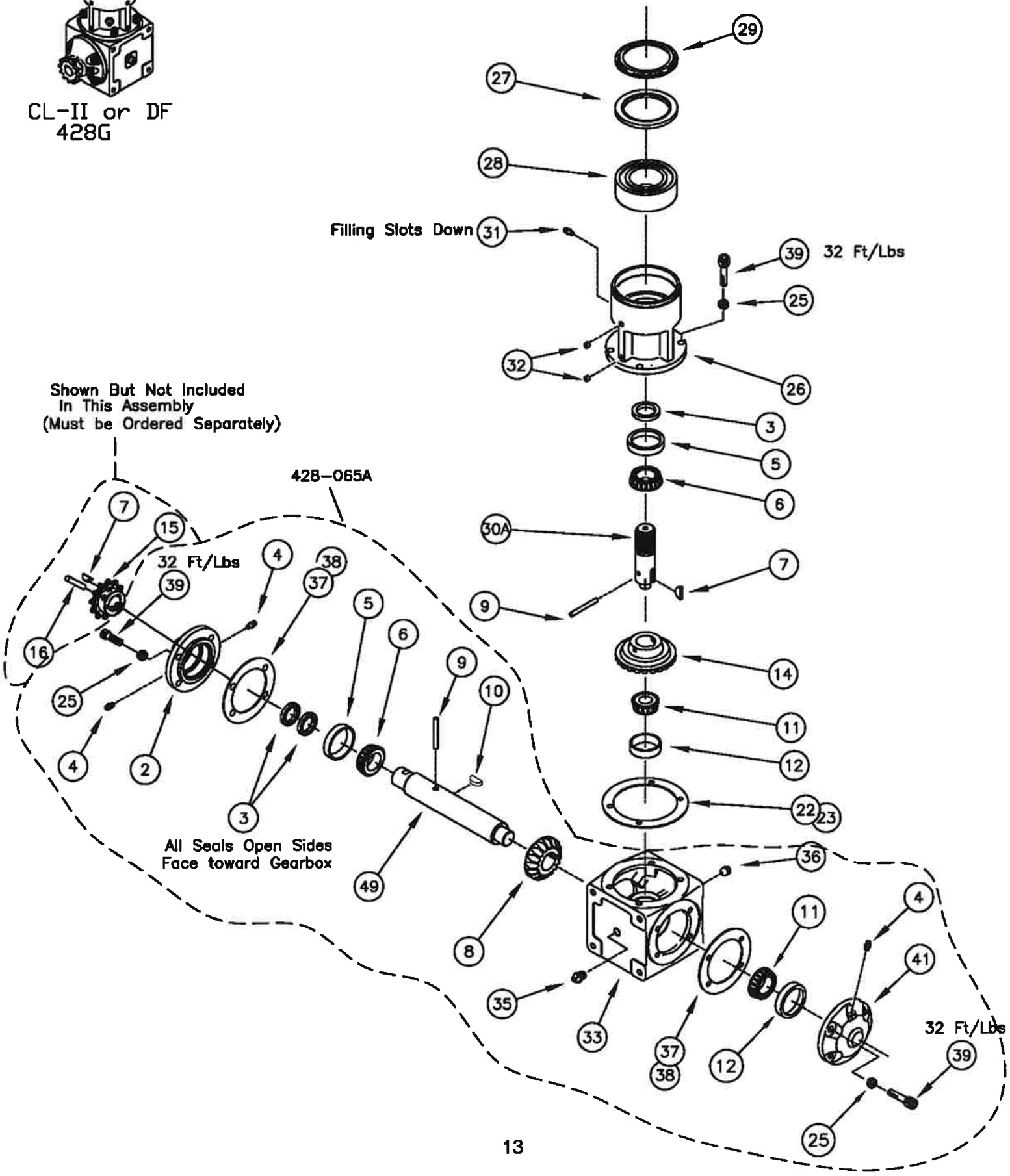
AR= As Required

CENTER / BOTTOM ASSEMBLY 428-035A

CIRCU-LATOR II OR DRI -FLO (428G-001A) (Blue)



CL-II or DF
428G



CENTER / BOTTOM ASSEMBLY 428-035A

CIRCU-LATOR II OR DRI-FLO (428G-001A) (IBlue)

CL-II or DF 428G

Item:	Description:	Qty.	Part No.	
-	Bottom Assembly, Long Input	-		
2	Cap, Side	1	428-005P	
3	Seal, 1-1/4" ID Viton: CR-12343	3	D-3640	
4	Grease Fitting: ALE# 3038-B	3	H-1056	
5	Bearing Cup: LM67010	2	D-2014-01	
6	Bearing Cone: LM67048	2	D-2013-01	
7	Key: Woodruff: 1/4 x 3/4"	1	D-1004-02	428-065A
8	Gear: 17 Teeth	1	D-3028	
9	Roll Pin: 1/4 x 2"	2	F-1036-29	
10	Key: Woodruff: 1/4 x 1.000"	1	D-1004-01	
11	Bearing Cone: M12649	2	D-2012-01	
12	Bearing Cup: M12610	2	D-2011-01	
14	Gear: 23 Teeth	1	D-3027	
22	Shim: 5.500" Dia. x .005"	AR	H-1069	
23	Shim: 5.500" Dia. x .015"	AR	H-1071	
25	L'Washer: 3/8" Heavy	12	F-1019-03	
49	Shaft, Input: Circ-2 Long	1	428-042P	
41	End Cap	1	428-034P	
26	SECTION, CENTER	1	428-015P	
27	Seal, Viton, CR# 29912	1	D-3643	
28	Bearing, DRB: Fafnir# 5211W	1	D-3166	
29	Washer, Protective	1	428-016P	
30	Shaft, Spline, 3.995"L	1	428-030P	
31	Grease Fitting: ALE# 3053-B	1	H-1300	
32	Pipe Plug: 1/16-27 NPT	4	H-1025-02	
33	HOUSING, BOTTOM	1	428-033P	
35	Grease Fitting: ALE# 1627-B	1	H-1010-02	
36	Pipe, Plug: 1/4-18 NPT	1	H-1025-01	
37	Shim: 4.500" Dia. x .005"	AR	H-1073	AR= As Required
38	Shim: 4.500" Dia. x .015"	AR	H-1075	
39	SHCS: 3/8-16 x 1, GR8, Blk	12	F-1388	
15	Sprocket	-	D-3212	See Page 40
16	Roll Pin, 5/16 x 1.75	-	F-1036-37	

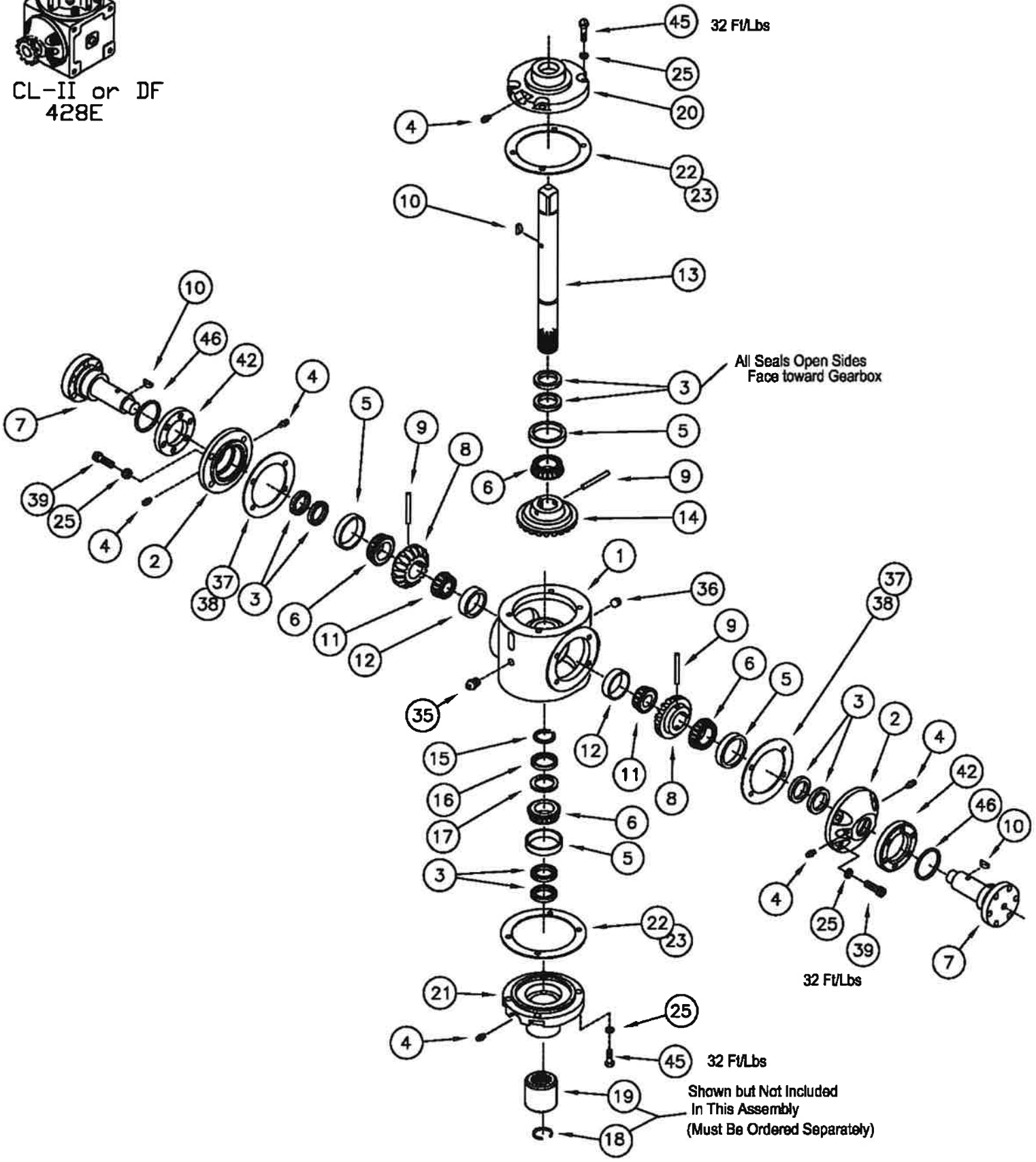
REFERENCE

	Reference			Assemblies
2	Cap, Side	1	428-005P	Assy: 428-022A
3	Seal, 1-1/4" ID: Viton: CR-12343	2	D-3640	
4	Grease Fitting: ALE# 3038-B	2	H-1056	
5	Bearing Cup: LM67010	1	D-2014-01	
13	Shaft, Main: 13" (Splined) Prev. Pg.	1	428-028P	Kit: 423-312-001A
	Coupler, Splined	1	203-054P	203-059A
18	Snap Ring, Internal: Eaton # NAN212	1	H-2551	
30	Shaft, Splined	1	428-030P	
-	Lubricant: Grease, Moly-Lithium Extreme Pressure #2 only (14 oz. Tube)	AR	C-6185	NAPA-VALV #633

TOP HOUSING ASSEMBLY 428-032A

CIRCU-LATOR II OR DRI-FLO (428E-001A) (Red)

CL-II or DF
428E



TOP HOUSING ASSEMBLY 428-032A

CIRCU-LATOR II OR DRI-FLO (428E-001A)(Red)

CL-II or DF
428E

Item:	Description:	Qty.	Part No.	Special Notes:
1	HOUSING, TOP	1	428-003P	
2	Cap, Side	2	428-005P	
3	Seal, 1-1/4" ID: (Viton) CR-12343	8	D-3640	
4	Grease Fitting: ALE# 3038-B	6	H-1056	
5	Bearing Cup: LM67010	4	D-2014-01	
6	Bearing Cone: LM67048	4	D-2013-01	
7	Shaft, Output, 1 pc. with Base	2	428-062P	
8	Gear, Pinion: 17 Teeth	2	D-3028	
9	Roll Pin: 1/4 x 2"	3	F-1036-29	
10	Key, Woodruff: 1/4 x 3/4"	3	D-1004-02	
11	Bearing Cone: M12649	2	D-2012-01	
12	Bearing Cup: M12610	2	D-2011-01	
13	Shaft, Main: 13" Splined, Woodruff Key	1	428-028P	
14	Gear: 23 Teeth	1	D-3027	
15	Snap Ring: Eaton# 336-2	1	F-1033-01	
16	Collar	1	203-002P	
17	Washer	1	F-8001-01	
20	Top Cap, Circ-2	1	428-009P	
21	Bottom Cap, Circ-2	1	428-012P	
22	Shim: 5.500" Dia. x .005"	AR	H-1069	
23	Shim: 5.500" Dia. x .015"	AR	H-1071	
25	L'Washer: 3/8" Heavy Spring	16	F-1019-03	
35	Grease Fitting: ALE# 1627-B	1	H-1010-02	
36	Pipe, Plug: 1/4-18 NPT	1	H-1025-01	
37	Shim: 4.500" Dia. x .005"	AR	H-1073	
38	Shim: 4.500" Dia. x .015"	AR	H-1075	
39	SHCS: 3/8-16 x 1-1/4", GR8, Blk	8	F-1170	
42	Flange	2	208-029P	
45	HHCS: 3/8-16 x 1.25", GR5, Ny	8	F-1032-01	
46	O-Ring	2	D-3771	

REFERENCE

Assemblies

2	Cap, Side	1	428-005P	Assy: 428-022A
3	Seal, 1-1/4" ID: (Viton) CR-12343	2	D-3640	
4	Grease Fitting: ALE# 3038-B	2	H-1056	
5	Bearing Cup: LM67010	1	D-2014-01	
20	Cap, Top	1	428-009P	Assy: 428-040A
3	Seal, 1-1/4" ID: (Viton) CR-12343	2	D-3640	
4	Grease Fitting: ALE# 3038-B	1	H-1056	
5	Bearing Cup: LM67010	1	D-2014-01	
21	Cap, Bottom	1	428-012P	Assy: 428-041A
3	Seal, 1-1/4" ID: (Viton) CR-12343	2	D-3640	
4	Grease Fitting: ALE# 3038-B	1	H-1056	
5	Bearing Cup: LM67010	1	D-2014-01	
2	Cap, Side	1	428-005P	Assy: 428-072A
3	Seal, 1-1/4" ID: (Viton) CR-12343	2	D-3640	
4	Grease Fitting: ALE# 3038-B	2	H-1056	This Side Cap Assembly (with Viton Seals) is meant for 428E-001A High Temp Gearbox, but it will serve as a replacement for both regular and high temp gearboxes when needed.
5	Bearing Cup: LM67010	1	D-2014-01	
6	Bearing Cone: LM67048	1	D-2013-01	
7	Shaft, Output	1	428-062P	
8	Gear, Pinion: 17 Teeth	1	D-3028	
9	Roll Pin: 1/4 x 2"	1	F-1036-29	
10	Key, Woodruff: 1/4 x 3/4"	1	D-1004-02	
42	Flange	1	208-029P	
18	Snap Ring, Internal: Eaton # NAN112	1	H-2551	203-059A
19	Coupler, Splined	1	203-054P	

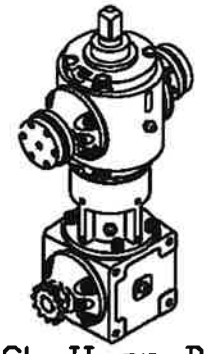
NOTE: See pg. 41 for Output Shaft Replacement Kit.

AR= As Required

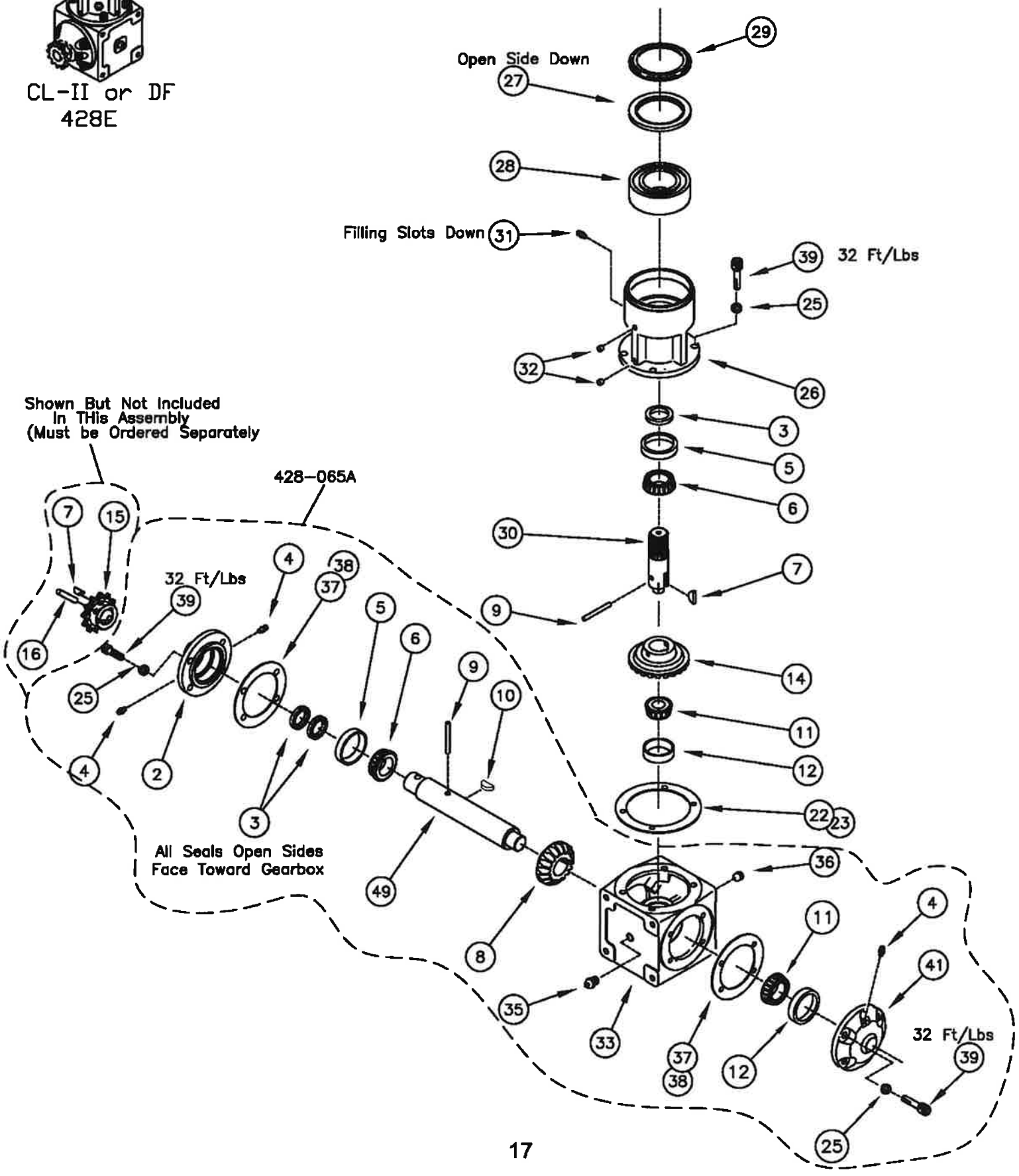
NA	Lubricant: Grease, Hi Temp, Chevron Ulti-Plex Synthetic Grease EP (14 oz. Tube)	AR	C-6188	

CENTER / BOTTOM ASSEMBLY 428-035A

CIRCU-LATOR II OR DRI-FLO (428E-001A) (Red)



CL-II or DF
428E



CENTER / BOTTOM ASSEMBLY 428-035A

CIRCU-LATOR II OR DRI-FLO (428E-001A) (Red)

CL-II or DF
428E

Item:	Description:	Qty.	Part No.	
-	Bottom Assembly, Long Input	-		
2	Cap, Side	1	428-005P	
3	Seal, 1-1/4" ID: CR-12343 (Viton)	3	D-3640	
4	Grease Fitting: ALE# 3038-B	3	H-1056	
5	Bearing Cup: LM67010	2	D-2014-01	
6	Bearing Cone: LM67048	2	D-2013-01	
7	Key: Woodruff: 1/4 x 3/4"	1	D-1004-02	
8	Gear: 17 Teeth	1	D-3028	
9	Roll Pin: 1/4 x 2"	2	F-1036-29	
10	Key: Woodruff: 1/4 x 1.000"	1	D-1004-01	428-065A
11	Bearing Cone: M12649	2	D-2012-01	
12	Bearing Cup: M12610	2	D-2011-01	
14	Gear: 23 Teeth	1	D-3027	
22	Shim: 5.500" Dia. x .005"	AR	H-1069	
23	Shim: 5.500" Dia. x .015"	AR	H-1071	
25	L'Washer: 3/8" Heavy	12	F-1019-03	
41	End Cap	1	428-034P	
49	Shaft, Input: Circ-2 Long, 8.039"L	1	428-042P	
26	SECTION, CENTER	1	428-015P	
27	Seal, Viton, CR# 29912	1	D-3643	
28	Bearing, DRB: Fafnir# 5211W	1	D-3166	
29	Washer, Protective	1	428-016P	
30	Shaft, Spline	1	428-030P	
31	Grease Fitting: ALE# 3053-B	1	H-1300	
32	Pipe Plug: 1/16-27 NPT	4	H-1025-02	
33	HOUSING, BOTTOM	1	428-033P	
35	Grease Fitting: ALE# 1627-B	1	H-1010-02	
36	Pipe, Plug: 1/4-18 NPT	1	H-1025-01	
37	Shim: 4.500" Dia. x .005"	AR	H-1073	
38	Shim: 4.500" Dia. x .015"	AR	H-1075	
39	SHCS: 3/8-16 x 1, GR8, Blk	12	F-1388	
15	Sprocket	-	D-3212	See Page 40
16	Roll Pin, 5/16 x 1.75	-	F-1036-37	

REFERENCE

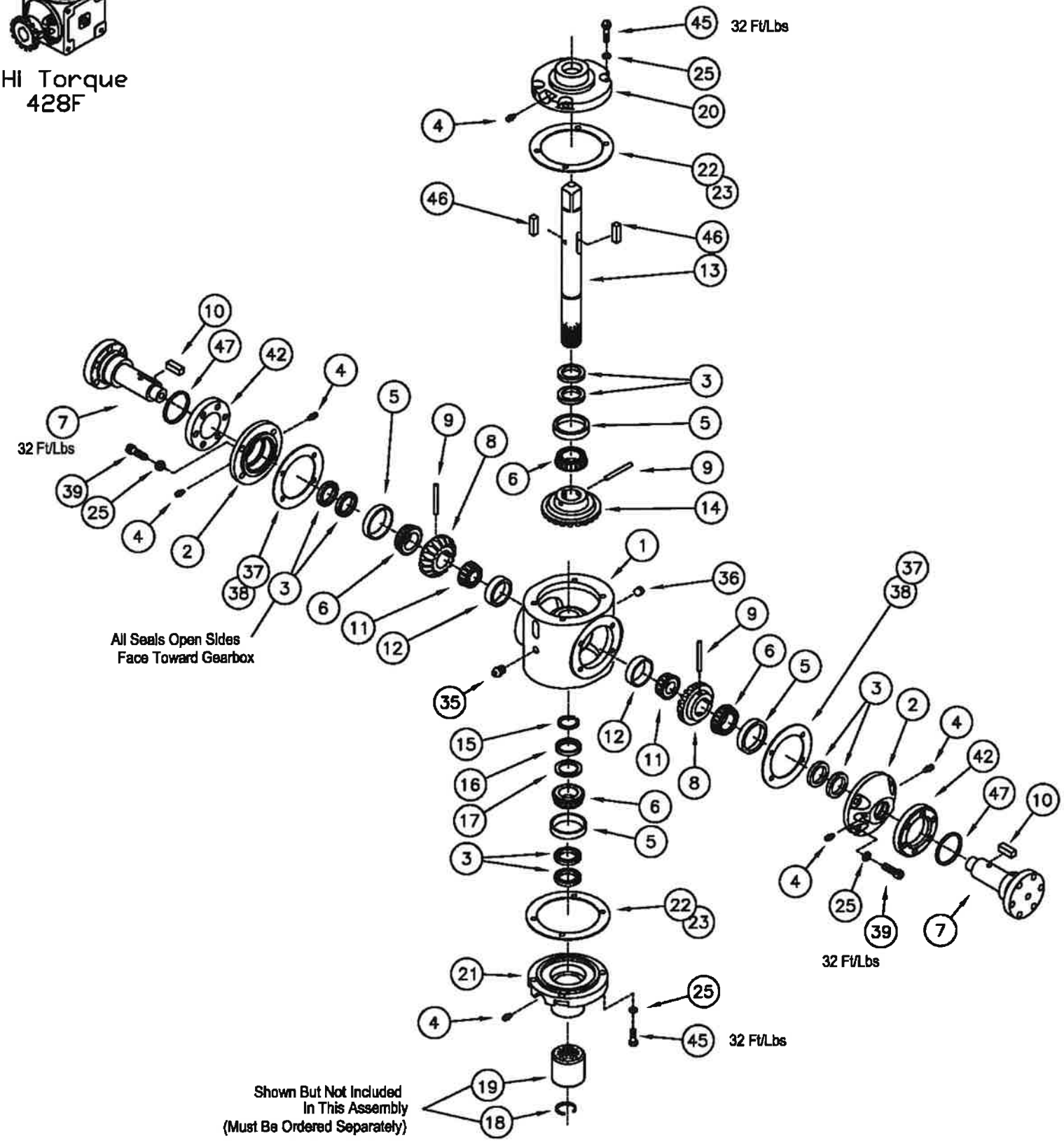
	Reference			Assemblies
2	Cap, End	1	428-005P	Assy: 428-022A
3	Seal, 1-1/4" ID: CR-12343 (Viton)	2	D-3640	
4	Grease Fitting: ALE# 3038-B	2	H-1056	
5	Bearing Cup: LM67010	1	D-2014-01	
13	Shaft, Main: 13" (Splined) Prev. Pg.	1	428-028P	Kit: 423-312-001A
	Coupler, Splined	1	203-054P	203-059A
18	Snap Ring, Internal: Eaton # NAN112	1	H-2551	
30	Shaft, Splined	1	428-030P	
-	Lubricant: Grease, Hi Temp (14 oz. Tube)	AR	C-6188	Chevron, Ulti-Plex Synthetic Grease, EP

AR= As Required

TOP HOUSING ASSEMBLY 428-052A

HI TORQUE (428F-001A) (Copper)

HI Torque
428F



TOP HOUSING ASSEMBLY 428-052A

HI TORQUE (428F-001A) (Copper)

Hi Torque
428F

Item:	Description:	Qty.	Part No.	Special Notes:
1	HOUSING, TOP	1	428-003P	
2	Cap, Side	2	428-005P	
3	Seal, 1-1/4" ID: (Viton) CR-12343	8	D-3640	
4	Grease Fitting: ALE# 3038-B	6	H-1056	
5	Bearing Cup: LM67010	4	D-2014-01	
6	Bearing Cone: LM67048	4	D-2013-01	
7	Shaft, Output Pinion, 1 pc, with Base	2	428-046P	
8	Gear, Pinion: 17 Teeth	2	D-3028	
9	Roll Pin: 1/4 x 2"	3	F-1036-29	
10	Key, Square; 5/16 x 1 1/8"	2	428-053P	
11	Bearing Cone: M12649	2	D-2012-01	
12	Bearing Cup: M12610	2	D-2011-01	
13	Shaft, Main, Circ 2F	1	428-047P	
14	Gear: 23 Teeth	1	D-3027	
15	Snap Ring: Eaton# 336-2	1	F-1033-01	
16	Collar	1	203-002P	
17	Washer	1	F-8001-01	
20	Top Cap, Circ-2	1	428-009P	
21	Bottom Cap, Circ-2	1	428-012P	
22	Shim: 5.500" Dia. x .005"	AR	H-1069	
23	Shim: 5.500" Dia. x .015"	AR	H-1071	
25	L'Washer: 3/8" Heavy Spring	16	F-1019-03	
35	Grease Fitting: ALE# 1627-B	1	H-1010-02	
36	Pipe, Plug: 1/4-18 NPT	1	H-1025-01	
37	Shim: 4.500" Dia. x .005"	AR	H-1073	
38	Shim: 4.500" Dia. x .015"	AR	H-1075	
39	SHCS: 3/8-16 x 1-1/4", GR8, Blk	8	F-1170	
42	Flange	2	208-029P	
45	HHCS: 3/8-16 x 1.25", GR5, Ny	8	F-1032-01	
46	Key, Square; 5/16 x .898	2	428-054P	
47	O-Ring	2	D-3771	

REFERENCE

				Assemblies
2	Cap, Side	1	428-005P	Assy: 428-022A
3	Seal, 1-1/4" ID: (Viton) CR-12343	2	D-3640	
4	Grease Fitting: ALE# 3038-B	2	H-1056	
5	Bearing Cup: LM67010	1	D-2014-01	
20	Cap, Top	1	428-009P	Assy: 428-040A
3	Seal, 1-1/4" ID: (Viton) CR-12343	2	D-3640	
4	Grease Fitting: ALE# 3038-B	1	H-1056	
5	Bearing Cup: LM67010	1	D-2014-01	
21	Cap, Bottom	1	428-012P	Assy: 428-041A
3	Seal, 1-1/4" ID: (Viton) CR-12343	2	D-3640	
4	Grease Fitting: ALE# 3038-B	1	H-1056	
5	Bearing Cup: LM67010	1	D-2014-01	
2	Cap, Side	1	428-005P	Assy: 428-043A
3	Seal, 1-1/4" ID: (Viton) CR-12343	2	D-3640	
4	Grease Fitting: ALE# 3038-B	2	H-1056	
5	Bearing Cup: LM67010	1	D-2014-01	
6	Bearing Cone: M12649	1	D-2012-01	
7	Shaft, Output Pinion	1	428-046P	
8	Gear, Pinion: 17 Teeth	1	D-3028	
9	Roll Pin: 1/4 x 2"	1	F-1036-29	
10	Key, Square 5/16 x 1/8"	1	428-053P	
42	Flange	1	208-029P	
18	Snap Ring, Internal, Eaton # NAN112	1	H-2551	203-059A
19	Coupler, Splined	1	203-054P	AR= As Required

NOTE: See pg. 41 for Output Shaft Replacement Kit

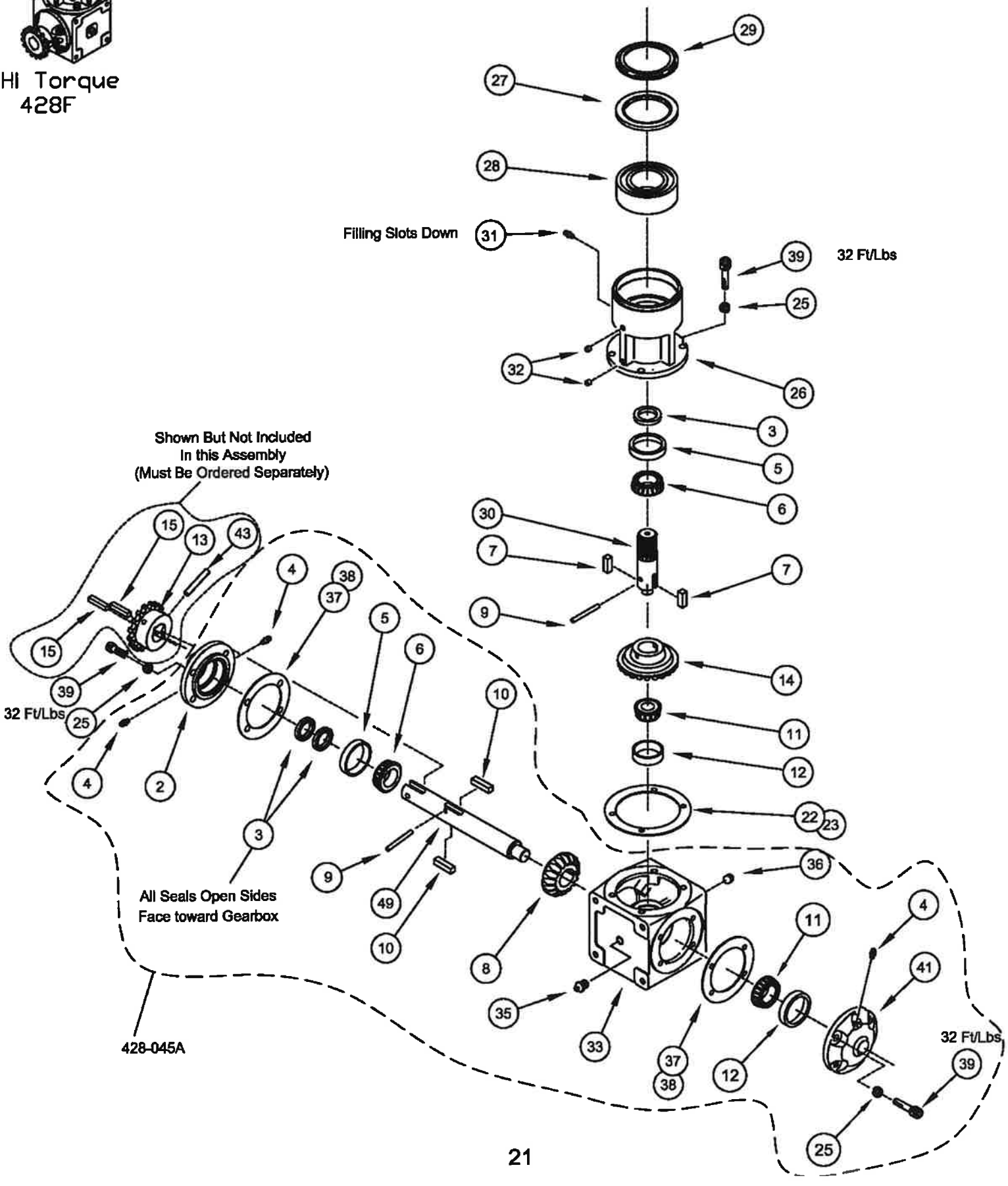
NA	Lubricant: Grease, Hi Temp Chevron Ulti-Plex Synthetic EP (14 oz. Tube)	AR	C-6188	—

CENTER / BOTTOM ASSEMBLY 428-044A (428-142A /2015)

HI TORQUE (428F-001A) (Copper)

Circu-Lator 3-Sweep (428Q-001A) (Orange) 2015 (Silver) -See pages 23-24

HI Torque
428F



CENTER / BOTTOM ASSEMBLY 428-044A (428-142A/2015)

CIRCU-LATOR **HI TORQUE** (428F-001A) (Copper)

CIRCU-LATOR 3-SWEEP (428Q-001A) (Orange) 2015 (Silver) -See pages 23-24

HI Torque
428F-001A

Item:	Description:	Qty.	Part No.	
-	Bottom Assembly, Long Input	-		
2	Cap, Side	1	428-005P	
3	Seal, 1-1/4" ID: CR-12343 (Viton)	3	D-3640	
4	Grease Fitting: ALE# 3038-B	3	H-1056	
5	Bearing Cup: LM67010	2	D-2014-01	
6	Bearing Cone: LM67048	2	D-2013-01	
7	Key: Square, 5/16 x .898"	2	428-054P	
8	Gear: 17 Teeth	1	D-3028	
9	Roll Pin: 1/4 x 2"	2	F-1036-29	
10	Sq. Key, 5/16"	2	428-053P	
11	Bearing Cone: M12649	2	D-2012-01	
12	Bearing Cup: M12610	2	D-2011-01	
14	Gear: 23 Teeth	1	D-3027	
22	Shim: 5.500" Dia. x .005"	AR	H-1069	
23	Shim: 5.500" Dia. x .015"	AR	H-1071	
25	L'Washer: 3/8" Heavy	12	F-1019-03	
26	SECTION, CENTER	1	428-015P	
27	Seal, Viton, CR# 29912	1	D-3643	
28	Bearing, DRB: Fafnir# 5211W	1	D-3166	
29	Washer, Protective	1	428-016P	
30	Shaft, Spline w/Dual Keyways	1	428-051P	
	Shaft, Spline w/Dual Keyways, Prehardened	1	428-051PX	
31	Grease Fitting: ALE# 3053-B	2	H-1300	
32	Pipe Plug: 1/16-27 NPT	4	H-1025-02	
33	HOUSING, BOTTOM	1	428-033P	
35	Grease Fitting: ALE# 1627-B	1	H-1010-02	
36	Pipe, Plug: 1/4-18 NPT	1	H-1025-01	
37	Shim: 4.500" Dia. x .005"	AR	H-1073	
38	Shim: 4.500" Dia. x .015"	AR	H-1075	
39	SHCS: 3/8-16 x 1, GR8, Blk	12	F-1388	
41	Blind Cap	1	428-034P	
49	Shaft, Input: Circ-2F w/Dual Keyways	1	428-050P	
15	Key, Square, 1/4 x 1 1/8"	-	656-027P	
13	Chain Coupler, 16 tooth	-	656-009P	See Page 40
43	Roll Pin, 5/16 x 1.750	-	F-1036-37	

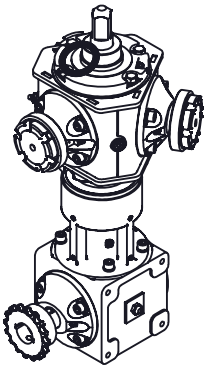
REFERENCE

2	Cap, End	1	428-005P	Assemblies Assy: 428-022A
3	Seal, 1-1/4" ID: CR-12343 (Viton)	2	D-3640	
4	Grease Fitting: ALE# 3038-B	2	H-1056	
5	Bearing Cup: LM67010	1	D-2014-01	
41	Cap, Blind. Circ2 Gearbox	1	428-034P	Assy: 428-057A
4	Grease Fitting: ALE# 3038-B	1	H-1056	
5	Bearing Cup: M12610	1	D-2011-01	

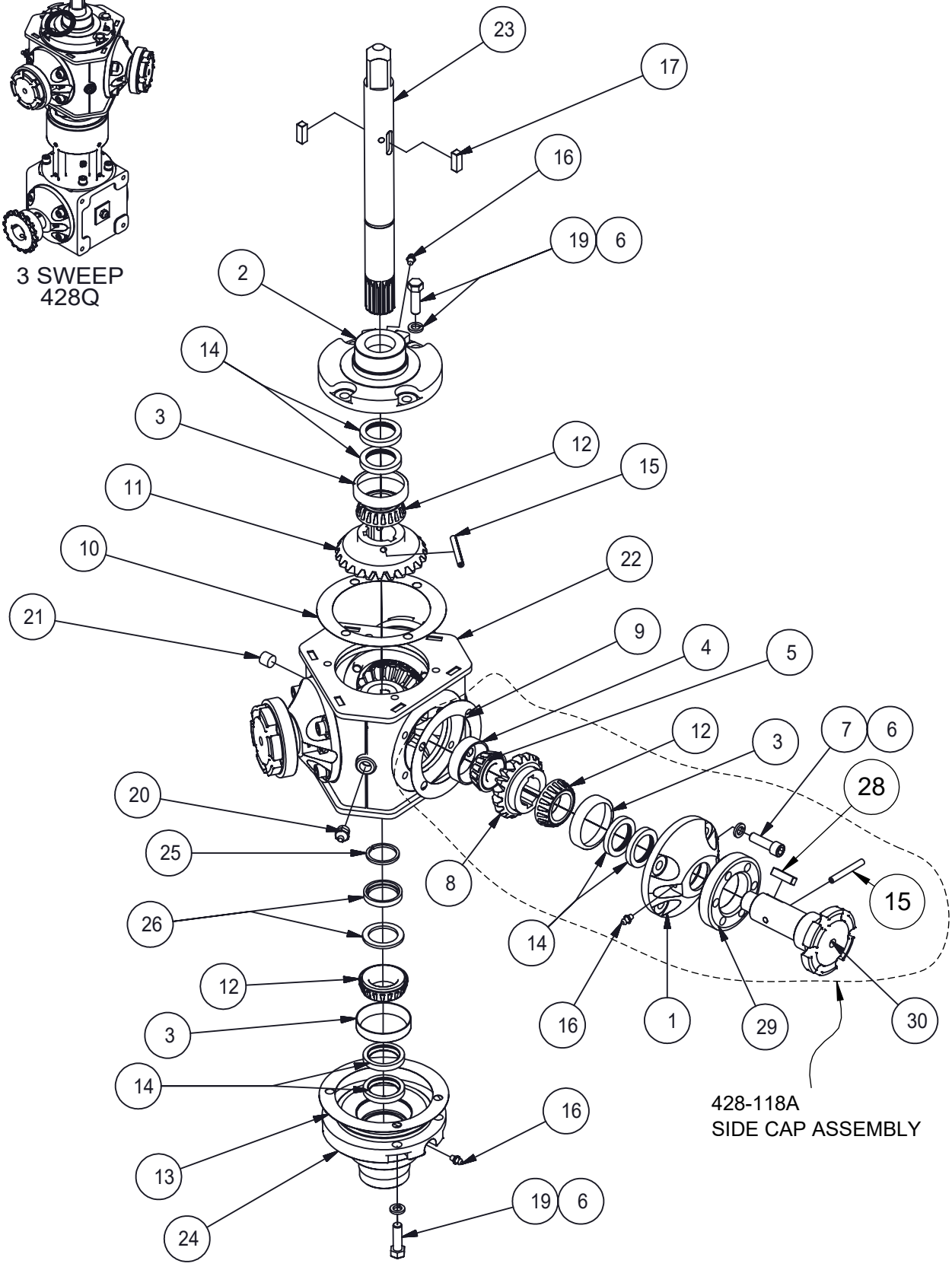
AR= As Required

-	Lubricant: Grease, HI Temp (14 oz. Tube)	AR	C-6188	Chevron Ulti-Plex Synthetic Grease EP

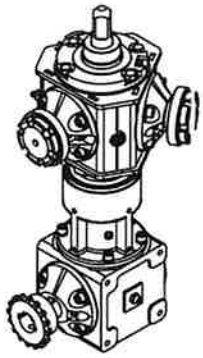
TOP HOUSING ASSEMBLY 428-117A
3-SWEEP (428Q-001A) (ORANGE)
TOP HOUSING ASSEMBLY 428-143A
3-SWEEP 2015 (SILVER)



3 SWEEP
428Q



TOP HOUSING ASSEMBLY, 428-117A
3-SWEEP (428Q-001A) (ORANGE)
TOP HOUSING ASSEMBLY,428-143A
3-SWEEP 2015 (SILVER)



3-SWEEP
428Q
428QX

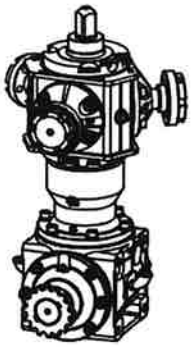
ITEM	QTY	PART NUMBER	DESCRIPTION
1	3	428-005P	Cap Side
2	1	428-009P	Cap, Top
3	5	D-2014-01	BEARING CUP 2.328 O.D.
4	3	D-2011-01	Bearing Cup, M12610, 1.9687 O.D.
5	3	D-2012-01	Bearing Cone, M12649, .8437 I.D.
6	20	F-1019-03	3/8" Lockwasher
7	12	F-1170	Sockethead Capscrew, 3/8-16x1.25
8	3	D-3028	Bevel Gears 17/23
9	3	H-1073	Shim, 4.5 O.D., 3.156 I.D. x .005 TH
10	1	H-1069	Shim, 5.5 O.D. 4.15625 I.D. x .005 TH
11	1	D-3027	Bevel Gears 17/23, 6
12	5	D-2013-01	Bearing Cone 1.25 Bore
13	1	H-1071	Shim, 5.500 OD x 4.15625 IDx .015 TH
14	10	D-3640	Oil Seal: 1.25" ID X 1.5" OD X 0.125" W
15	4	F-1036-29	1/4 x 2" Roll Pin
16	8	H-1056	1/4" Grease Fitting
17	2	428-054P	Square Key, 5/16 x .898
18	2	D-3771	O-Ring, Viton, 1 7/8 I.D. x 2 1/16 O.D.
19	8	F-1032-01	3/8-16 x 1-1/4" Capscrew
20	1	H-1010-02	Grease Fitting, Short Straight 1/4-18 NPT
21	2	H-1025-01	Pipe Plug, 1/4-18 NPT
22	1	428-088W	C3GB Top Housing Weldment
23	1	428-110P	C3GB Main Shaft, w/Splines (Std Ht +1/2") 428Q
23	1	428-110PX	C3GB Main Shaft (prehardened) w/Splines 428QX, 428R
24	1	428-111P	Bottom Cap, Circ 2 Gearbox
25	1	F-1033-01	Retaining Ring, 1.184
26	1	F-8001-01	Washer, 1.25ID x 1.75OD x .125 TH
27	1	203-002P	Collar, 1.625
28	3	428-053P	HTGB Square Key, 5/16 x 1 1/8"
29	3	708-005P	Stepped Flange, 3 Sweep
30	3	428-116P	Output Pinion Shaft, C3

REFERENCE:
SIDE CAP ASSEMBLY-
428-118A

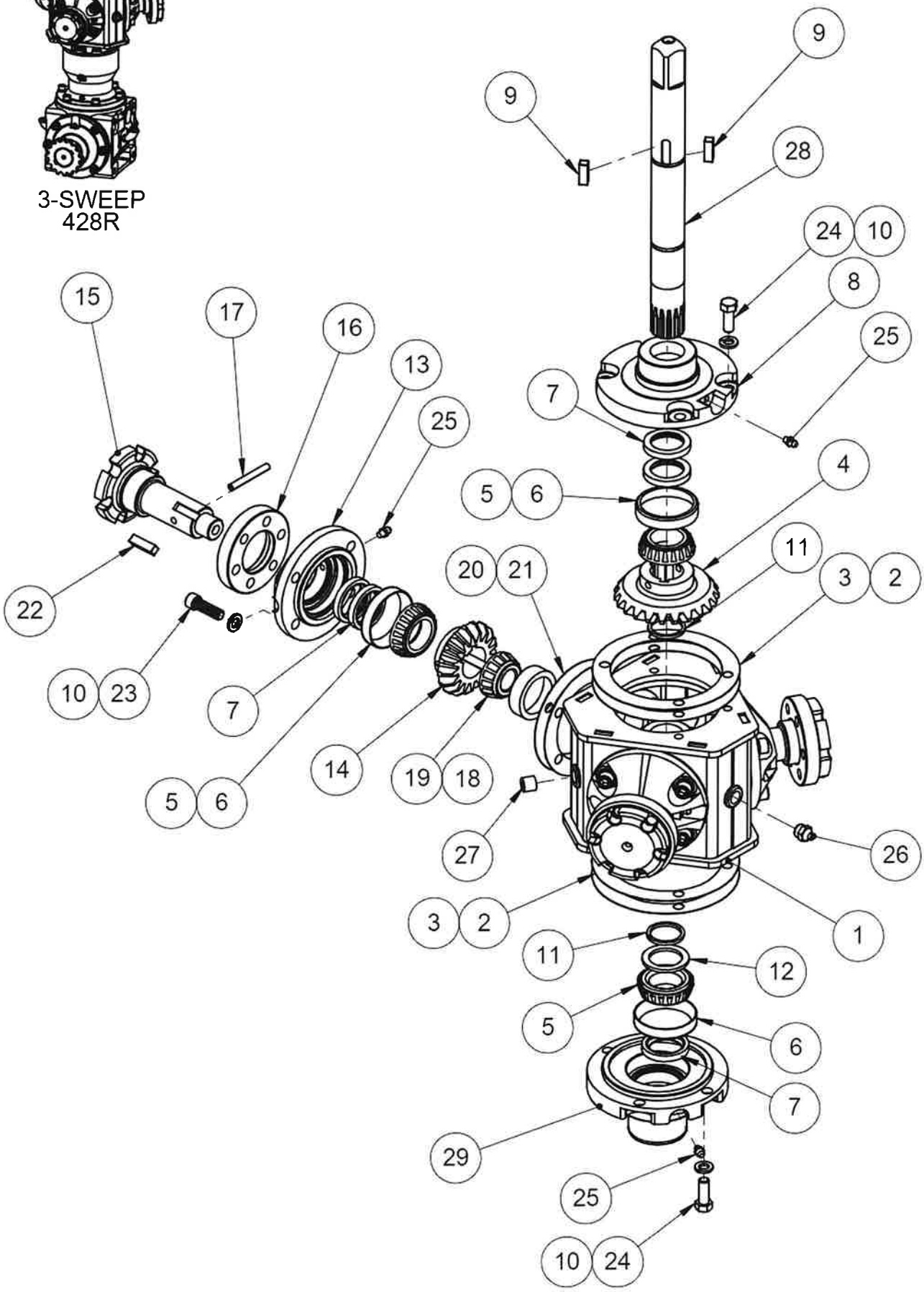
QTY	PART NUMBER	DESCRIPTION
1	428-005P	Cap Side
2	D-3640	Oil Seal: 1.25" ID X 1.5" OD X 0.125" W
1	D-2014-01	BEARING CUP 2.328 O.D.
1	D-2013-01	BEARING CONE 1.25 BORE
1	D-3028	Bevel Gears 17/23, 6
1	428-116P	Output Pinion Shaft, C3
1	708-005P	Stepped Flange, 3 Sweep
1	F-1036-29	1/4 x 2" Roll Pin
1	428-053P	HTGB Square Key, 5/16 x 1 1/8"
2	H-1056	1/4" Grease Fitting
1	D-2012-01	Bearing Cone, M12649, .8437 I.D.
2	H-1073	Shim, 4.5 O.D., 3.156 I.D. x .005 TH

TOP HOUSING ASSEMBLY 428-109A

CIRCULATOR 3-SWEEP (428R-001A) BROWN

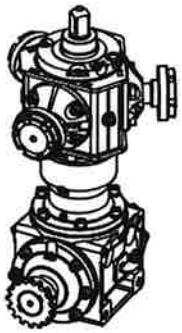


3-SWEEP
428R



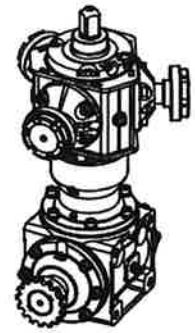
TOP HOUSING ASSEMBLY 428-109A

CIRCULATOR 3-SWEEP (428R-001A) (BROWN)



3-SWEEP 428R

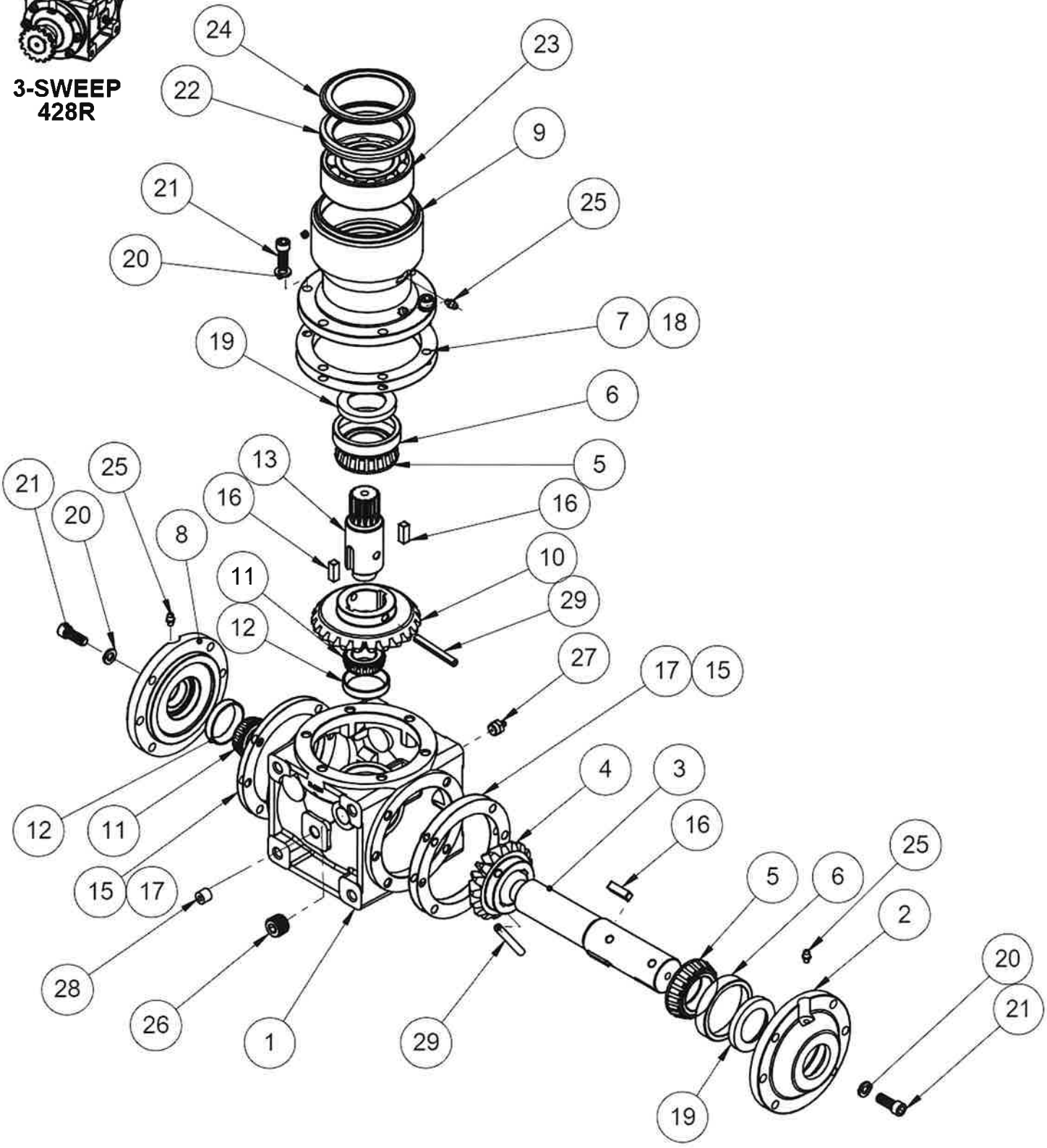
ITEM	PART NO.	DESCRIPTION	QTY.
1	428-088W	3-PORT GEARBOX TOP HOUSING	1
2	H-1069	GASKET	2
3	H-1071	GASKET	2
4	D-3027	HTGB BEVEL GEAR, 23-TOOTH	1
5	D-2013-01	CONE-BEARING	5
6	D-2014-01	CUP-BEARING	5
7	D3640	VITON SEAL CR#12343 1.25ID X 1.756 OD	9
8	428-009P	CIRC-2 GEARBOX TOP CAP	1
9	428-054P	HTGB KEY, SQ: 5/16" X .898" L,8630	2
10	F-1019-03	LOCKWASHER, HVY, 3/8, YZ	20
11	F-1033-01	RING-RETAINING	2
12	F-8001-01	WASHER	1
13	428-005P	CAP, SIDE	3
14	D-3028	GEAR, 17 TOOTH BEVEL	3
15	428-116P	OUTPUT PINION SHAFT, C3	3
16	708-005P	STEPPED FLANGE, TAPERED SWEEP	3
17	F-1036-29	SPIRAL SPRING HVY 1/4 X 2 HBK	3
18	D-2011-01	CUP-BEARING	3
19	D-2012-01	CONE-BEARING	3
20	H-1073	GASKET	3
21	H-1075	GASKET	3
22	428-053P	HI-TORQUE GEAR BOX (HTGB) KEY, SQ: 5/16" X 1-1/8" L,8630	3
23	F-1170	SHCS, 3/8-16 X 1-1/4", w/PATCH, GR8	12
24	F-1394	HHCS,3/8-16NC X 1",GR.5, YELLOW PLATED	8
25	H-1056	1/4" GREASE FITTING	8
26	H-1010-02	FITTING,GREASE,1/4-18NPT STRAIGHT	1
27	H-1025-01	PIPE PLUG, 1/4 HEX SOCKET HD	2
28	428-146P	C3GB MAIN SHAFT	1
29	428-012P	CAP, BOTTOM	1



3-SWEEP
428R

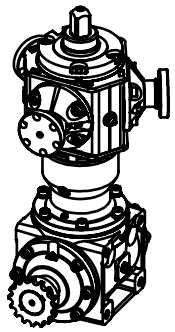
CENTER/BOTTOM ASSEMBLY 428-132A

CIRCULATOR 3-SWEEP (428R-001A) (BROWN)



CENTER/BOTTOM ASSEMBLY 428-132A

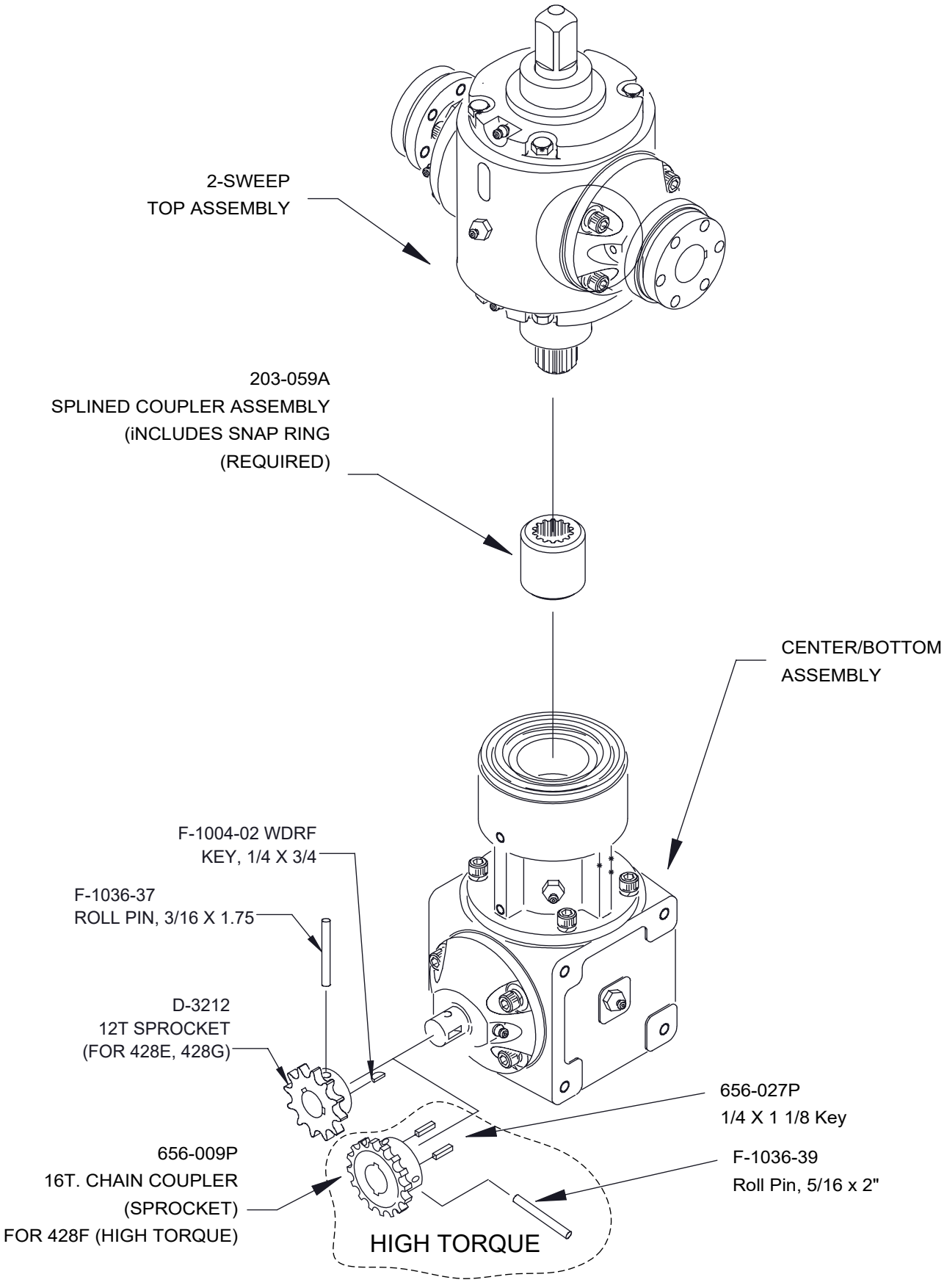
CIRCULATOR 3-SWEEP (428R-001A) (BROWN)



3-SWEEP 428R

ITEM	PART NO.	DESCRIPTION	Defaul t/QTY.
1	428-129P	C3GB: BOTTOM HOUSING	1
2	428-127P	C3GB END CAP	1
3	428-125P	C3GB: INPUT SHAFT	1
4	D-3927	PINION GEAR: 17TX5DPX 1.625"ID	1
5	D-3821	Cone, TRBrg: 1.625"IDx0.780W, LM501349	2
6	D-3822	Cup, TRBrg: 2.891"ODx0.580"W, LM501310	2
7	H-2875	C3GB SHIM GASKET: 6.000"OD x 4.640"ID x 0.005"TH	3
8	428-128P	C3GB BLIND CAP	1
9	428-131P	C3GB: CENTER SECTION	1
10	D-3926	BEVEL GEAR: 23TX5DPX1.625INID	1
11	D-2018-01	TRB Cone 44643	2
12	D-2019-01	TRB Cup L44610	2
13	428-130P	C3GB: CENTER SHAFT	1
15	H-2873	C3GB SHIM GASKET, 5.625"OD x 4.265"ID x .005"TH	3
16	428-134P	KEY, 5/16 X 3/8 X 1.125	4
17	H-2874	C3GB SHIM GASKET, 5.625"OD x 4.265"ID x .015"TH	3
18	H-2876	C3GB SHIM GASKET, 6.000"OD x 4.640"ID x .015"TH	3
19	D-3819	OIL SEAL, VITON: 1.625ID X 2.500 OD X .313 W	2
20	F-1019-03	LOCKWASHER, HVY, 3/8, YZ	18
21	F-1170	SHCS, 3/8-16 X 1-1/4", w/PATCH, GR5	18
22	D-3643	VITON SEAL CR#29912 3.00IDX4.008OD	1
23	D-3166	BEARING, DOUBLE ROW W 2.615" BORE; 3.937" OD; 1.3125" THK	1
24	428-016P	C2GB: PROTECTOR WASHER	1
25	H-1056	FITTING, GREASE, 1/4-28, SELF-TAP	4
26	H-1963	NPTF, HEX-SOCKET PLUG WITH MAGNET, 1/2-14	1
27	H-1010-02	FITTING,GREASE,1/4-18NPT STRAIGHT	3
28	H-1025-01	PIPE PLUG, 1/4 HEX SOCKET HD	2
29	F-1273	ROLL PIN, 5/16 X 2 1/2"L	2
30	H-1173	ELBOW,1/4" 9OD STREET,SCH40	2
31	F-1252	SCREW, SET SKT CP PT 1/4-28 X 1/4	2

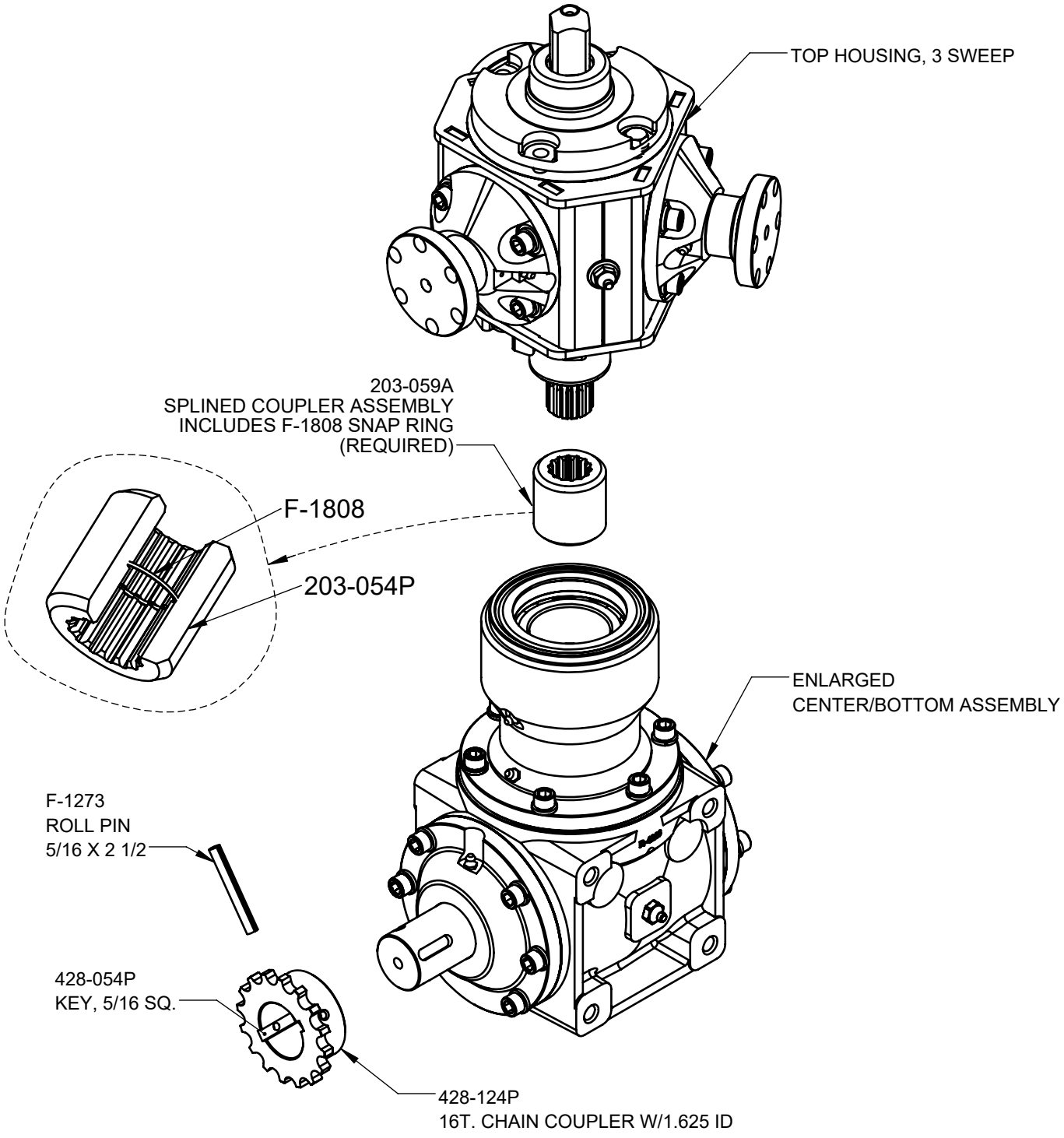
428E SERIES GEARBOX



428R SERIES GEARBOX

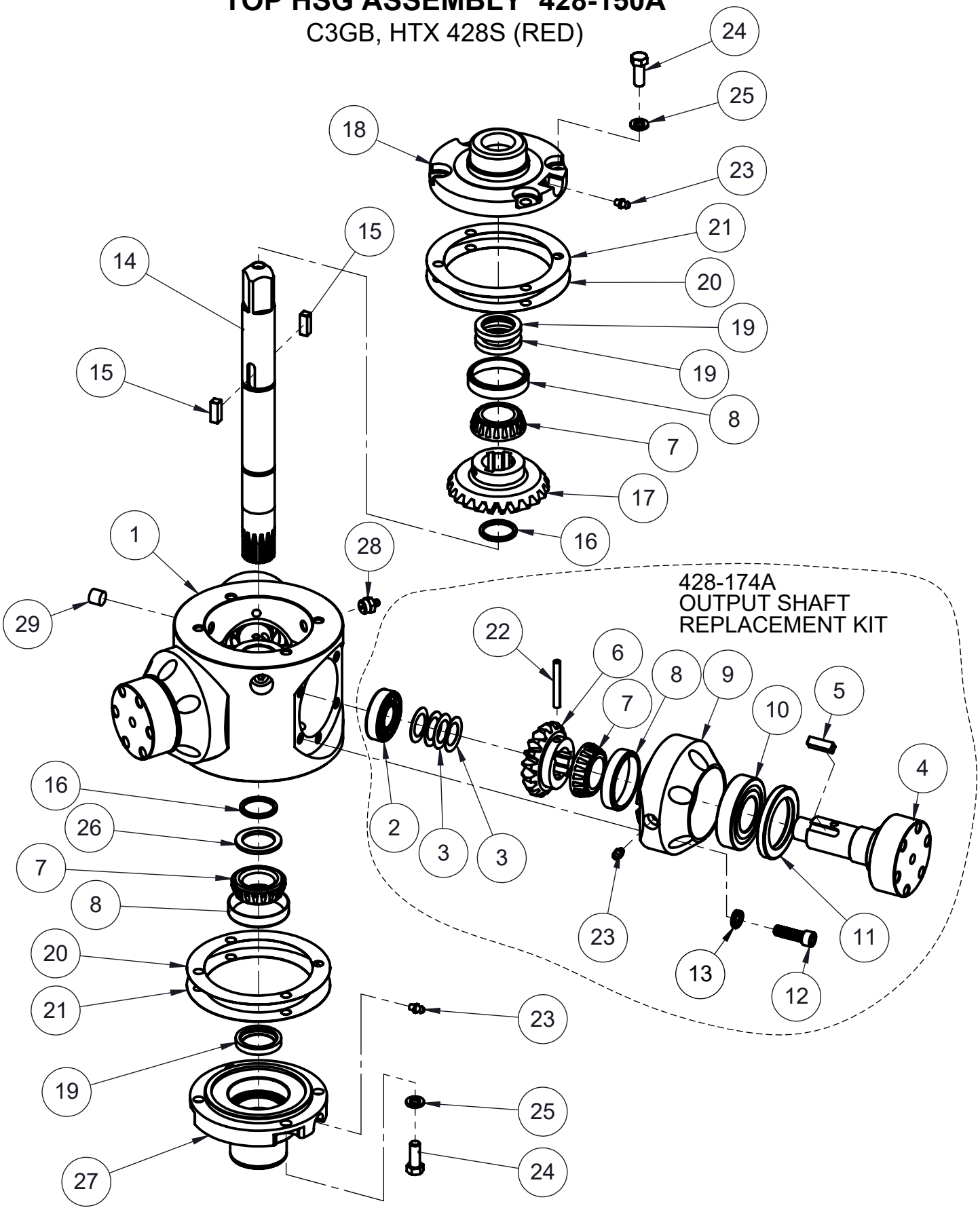
WITH ENLARGED CENTER/BOTTOM ASSEMBLY

3 SWEEP FINAL ASSEMBLY

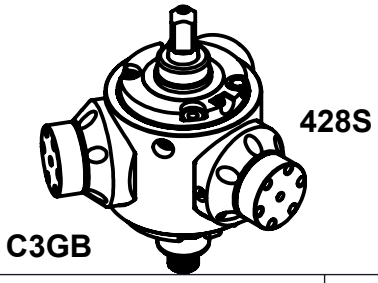


TOP HSG ASSEMBLY 428-150A

C3GB, HTX 428S (RED)



TOP HSG ASSEMBLY 428-150A
C3GB, HTX 428S (RED)



ITEM	PART NO.	DESCRIPTION	QTY
1	428-179P	C3GB, HT: TOP HOUSING	1
2	D-4009	BEARING, RAD. BALL (1-Row): 62/22	3
3	D-4015	WASHER, BELLEVILLE: 22.4MMIDX34.6MMODX0.5MMT	12
4	428-156P	C3GB, HTX: OUTPUT SHAFT	3
5	428-053P	HI-TORQUE GEAR BOX (HTGB) KEY, SQ: 5/16" X 1-1/16"L, 8630	3
6	D-3028	GEAR, 17 TOOTH BEVEL	3
7	D-2013-01	CONE-BEARING	5
8	D-2014-01	CUP-BEARING	5
9	428-149P	C3GB, HTX: SIDE CAP, 6-BOLT	3
10	D-4016	BRG,BALL (1-ROW): 35mmIDx72mmODx17mmW,6207LU	3
11	D-4007	Seal, Oil: 52mmIDx72mmODx8mmW	3
12	F-1170	SHCS, 3/8-16 X 1-1/4", w/PATCH, GR8	18
13	F-1636	LOCKWASHER 3/8, HICOLLAR, SPRING	18
14	428-146P	C3GB MAIN SHAFT	1
15	428-054P	HIGH TORQUE GEARBOX (HTGB) KEY, SQ: 5/16" X .898" L,8630	2
16	F-1033-01	RING-RETAINING	2
17	D-3027	HIGH TORQUE CIRC-2 GEARBOX BEVEL GEAR, 23-TOOTH	1
18	428-009P	CAP, TOP	1
19	D3640	VITON SEAL CR#12343 1.25ID X 1.756 OD	3
20	H-1069	GASKET	4
21	H-1071	GASKET	4
22	F-1036-29	SPIRAL SPRING HVY 1/4 X 2 HBK CARBON, HEAVY DUTY.035 THK MAT'L	3
23	H-1056	FITTING, GREASE, 1/4-28, SELF-TAP	8
24	F-1394	HHCS,3/8-16NC X 1",GR.5, YELLOW PLATED	8
25	F-1019-03	LOCKWASHER, HVY, 3/8, YZ	8
26	F-8001-01	WASHER	1
27	428-012P	C2GB: BOTTOM CAP	1
28	H-1010-02	FITTING,GREASE,1/4-18NPT STRAIGHT STEEL/ ALEMITE	1
29	H-1025-01	PIPE PLUG, 1/4 HEX SOCKET HD PRESSURE PLUG	2

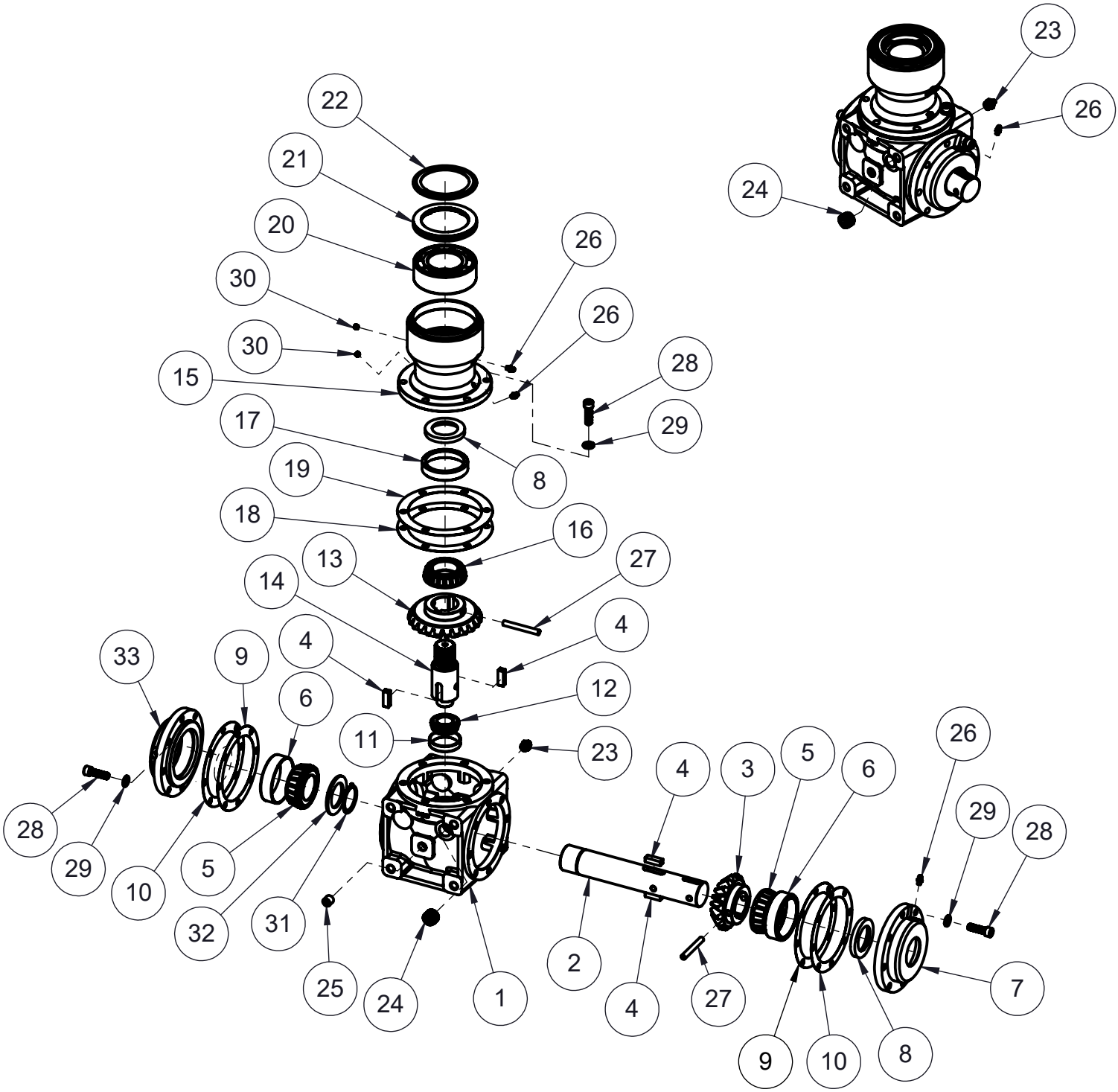
428-174A OUTPUT SHAFT REPLACEMENT KIT

ITEM	PART NO.	DESCRIPTION	QTY
1	428-179P	C3GB, HT: TOP HOUSING,	1
2	D-4009	BEARING, RAD. BALL (1-Row): 62/22	1
3	D-4015	WASHER, BELLEVILLE: 22.4MMIDX34.6MMODX0.5MMT	4
4	428-156P	C3GB, HTX: OUTPUT SHAFT	1
5	428-053P	HI-TORQUE GEAR BOX (HTGB) KEY, SQ: 5/16" X 1-1/16"L, 8630	1
6	D-3028	GEAR, 17 TOOTH BEVEL	1
7	D-2013-01	CONE-BEARING	1
8	D-2014-01	CUP-BEARING	1
9	428-149P	C3GB, HTX: SIDE CAP, 6-BOLT	1
10	D-4016	BRG,BALL (1-ROW): 35mmIDx72mmODx17mmW,6207LU	1
11	D-4007	Seal, Oil: 52mmIDx72mmODx8mmW	1
12	F-1170	SHCS, 3/8-16 X 1-1/4", w/PATCH, GR8	6
13	F-1636	LOCKWASHER 3/8, HICOLLAR, SPRING	6
22	F-1036-29	SPIRAL SPRING HVY 1/4 X 2 HBK CARBON, HEAVY DUTY.035 THK MAT'L 1/4 X 2"/CEM. #12777	1
23	H-1056	FITTING, GREASE, 1/4-28, SELF-TAP	1

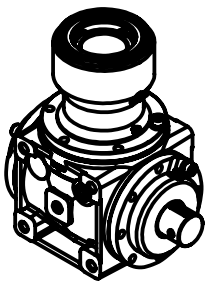
BOTTOM HSG ASSEMBLY 428-151A

C3GB, HTXC 428S (RED)

LUBRICATION FITTINGS



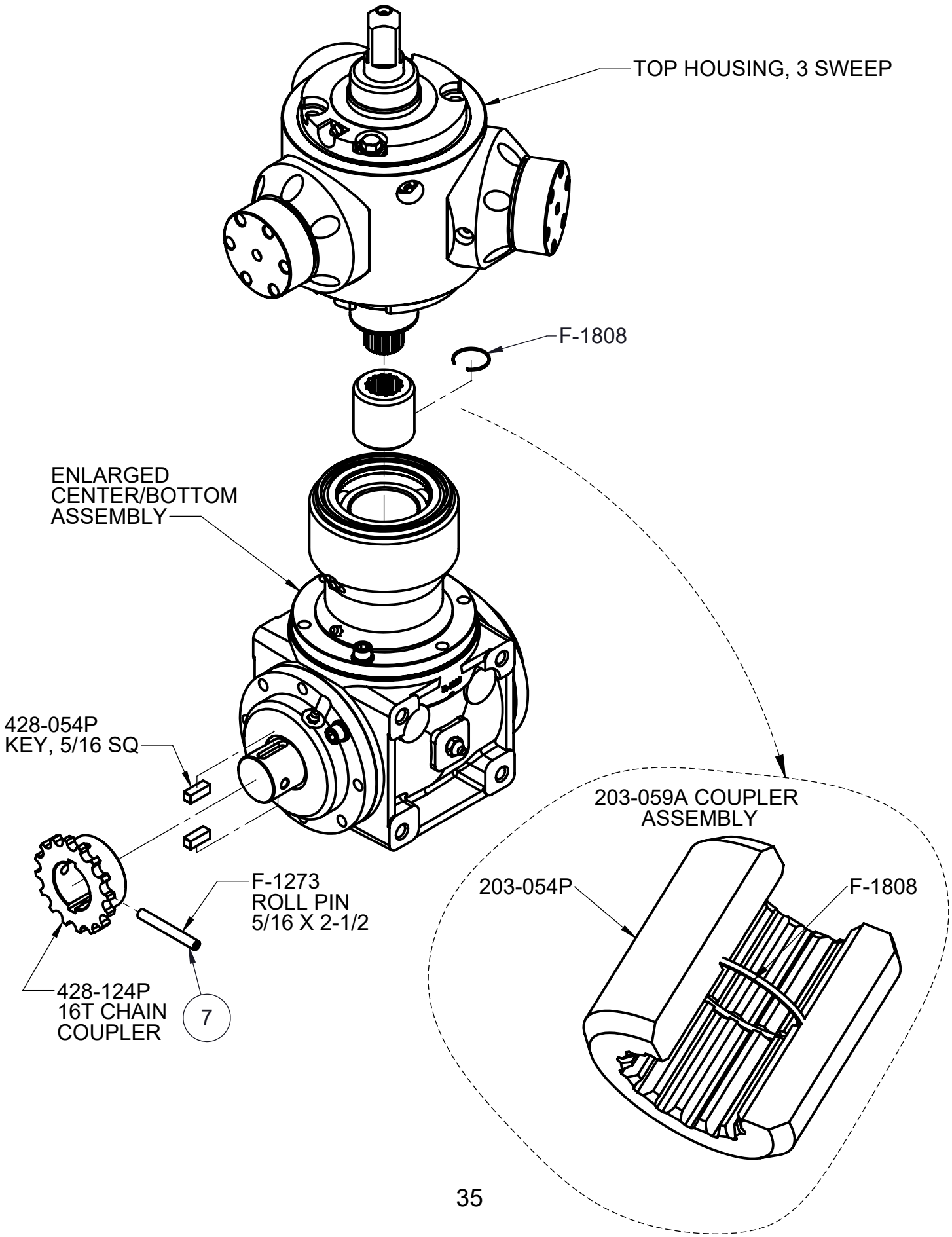
BOTTOM HSG ASSEMBLY 428-151A
C3GB, HTXC 428S (RED)



ITEM	PART NO.	DESCRIPTION	QTY
1	428-129P	C3GB: BOTTOM HOUSING	1
2	428-164P	C3GB,HTX: INPUT SHAFT (9.720"L)	1
3	D-3927	PINION GEAR: 17TX5DPX 1.625"ID	1
4	428-134P	KEY, 5/16 X 3/8 X 1.125	4
5	D-4010	Bearing CONE, TRB: 26885	2
6	D-4011	Bearing, CUP, TRB: 26823	2
7	428-154P	C3GB, HTX: INPUT CAP	1
8	D-3819	OIL SEAL, VITON: 1.625ID X 2.500 OD X .313 W	2
9	H-3113	SHIM GASKET: 5.50"ODX4.260'ID X.005'TX.375'HOLES(8)	2
10	H-3114	SHIM GASKET: 5.50"ODX4.260'ID X.015'TX.375'HOLES(8)	2
11	D-2019-01	TRB Cup L44610	1
12	D-2018-01	TRB Cone 44643	1
13	D-3926	BEVEL GEAR: 23TX5DPX1.625INID	1
14	428-130P	C3GB: CENTER SHAFT	1
15	428-131P	C3GB: CENTER SECTION	1
16	D-3821	Cone, TRBrg: 1.625"IDx0.780W, LM501349	1
17	D-3822	Cup, TRBrg: 2.891"ODx0.580"W, LM501310	1
18	H-2875	C3GB SHIM GASKET: 6.000"OD x 4.640"ID x 0.005"TH	1
19	H-2876	C3GB SHIM GASKET, 6.000"OD x 4.640"ID x .015"TH	1
20	D-3166	BEARING, DOUBLE ROW #3211W 2.615" BORE; 3.937" OD; 1.3125" THK, FULL SETS DBL ROW BEARINGS	1
21	D-3643	VITON SEAL CR#29912 VITON SEAL, 3.00IDX4.008OD	1
22	428-016P	C2GB: PROTECTOR WASHER	1
23	H-1010-02	FITTING,GREASE,1/4-18NPT STRAIGHT STEEL	1
24	H-1963	NPTF, HEX-SOCKET PLUG WITH MAGNET, 1/2-14	1
25	H-1025-01	PIPE PLUG, 1/4 HEX SOCKET HD PRESSURE PLUG	1
26	H-1056	FITTING, GREASE, 1/4-28, SELF-TAP	3
27	F-1273	ROLL PIN, 5/16 X 2 1/2"L	2
28	F-1170	SHCS, 3/8-16 X 1-1/4", w/PATCH, GR8	3
29	F-1019-03	LOCKWASHER, HVY, 3/8, YZ	3
30	F-1252	SCREW, SET SKT CP PT 1/4-28 X 1/4	2
31	H-2688	SNAP RING, EXT. 1.625 SHAFT, IRR#3100-162	1
32	H-3128	WASHER, LOW-CARBON ST: 1-5/8"IDX2-3/8"ODX0.134t	1
33	428-165P	C3GB, HTX: BLIND CAP	1

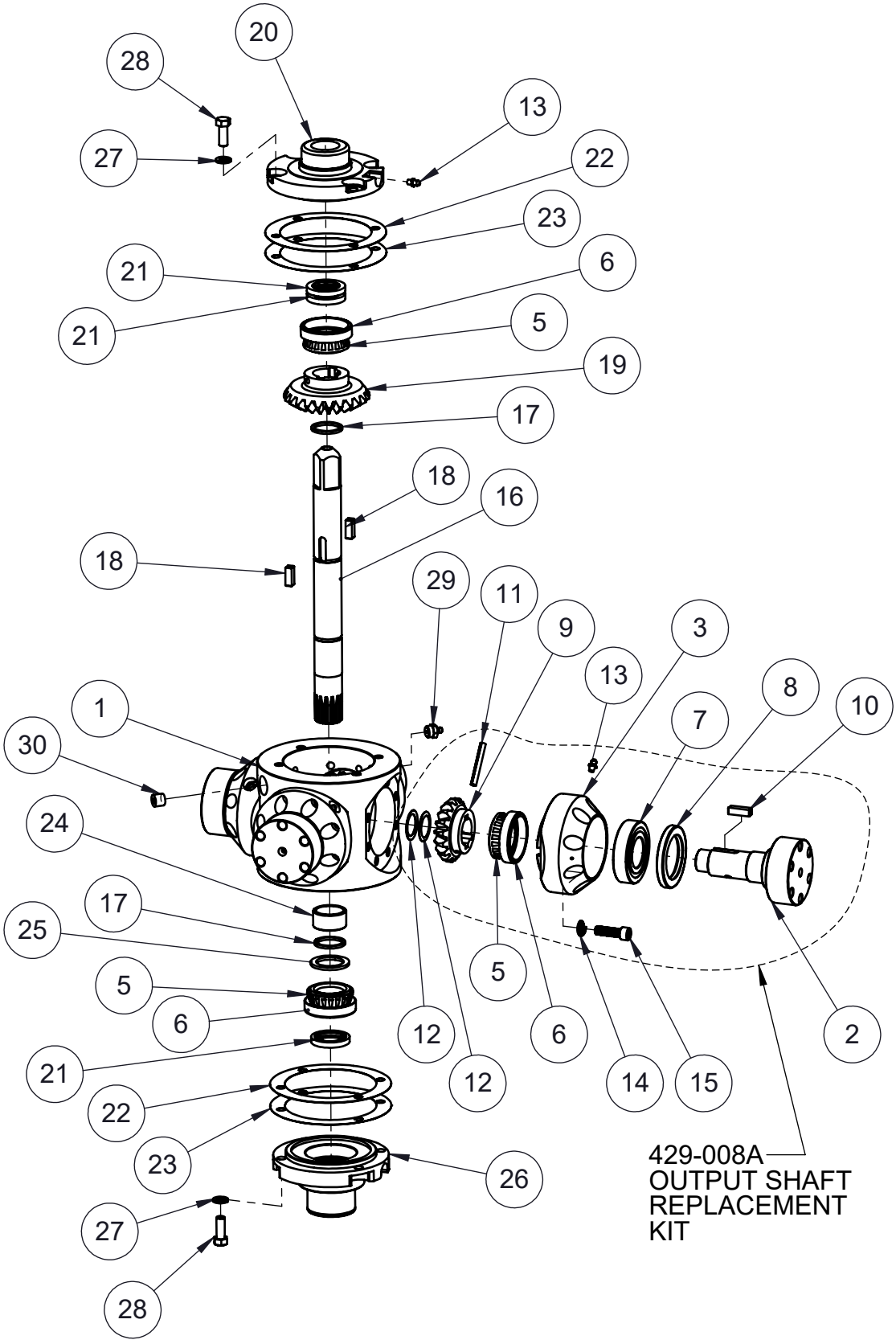
428S SERIES GEARBOX

C3GB, HTX 428S (RED)



TOP HSG ASSEMBLY, 428-167A

4 SWP DF2500 (RED)



TOP HSG ASSEMBLY, 428-167A

4 SWP DF2500 (RED)

ITEM	PART NO.	DESCRIPTION	QTY
1	428-168P	DF4-2400, HTX: Top Housing w/Flanged Sleeve Bearings	1
2	428-169P	DF4-2400GB, HTX: OUTPUT SHAFT W/LINER	4
3	428-159P	DF3-25CGB, HTX: SIDE CAP, 8-BOLT	4
4			
5	D-2013-01	CONE-BEARING	6
6	D-2014-01	CUP-BEARING	6
7	D-4016	BRG,BALL (1-ROW): 35mmIDx72mmODx17mmW,6207LU	4
8	D-4007	Seal, Oil: 52mmIDx72mmODx8mmW	4
9	D-3028	GEAR, 17 TOOTH BEVEL	4
10	428-053P	HI-TORQUE GEAR BOX (HTGB) KEY, SQ: 5/16"" X 1-1/16""L, 8630	4
11	F-1036-29	SPIRAL SPRING HVY 1/4 X 2 HBK CARBON, HEAVY DUTY.035 THK MAT'L	4
12	D-4086	WASHER, BELLEVILLE: 1.00""IDx1.358""ODx0.0197""T	8
13	H-1056	FITTING, GREASE, 1/4-28, SELF-TAP	6
14	F-1636	LOCKWASHER 3/8, HICOLLAR, SPRING	32
15	F-1170	SHCS, 3/8-16 X 1-1/4", w/PATCH, GR8	32
16	428-146P	C3GB MAIN SHAFT	1
17	F-1033-01	RING-RETAINING	2
18	428-054P	Key: 5/16"SQ x .898"L	2
19	D-3027	HIGH TORQUE CIRC-2 GEARBOX BEVEL GEAR, 23-TOOTH	1
20	428-009P	CAP, TOP	1
21	D3640	VITON SEAL CR#12343 1.25ID X 1.756 OD SIMILAR TO NITRILE SEAL	3
22	H-1071	GASKET	2
23	H-1069	GASKET	2
24	D-4014	BRG, BRNZ SLEEVE: 1-1/4"IDX1-1/2"ODX3/4"L	1
25	F-8001-01	WASHER	1
26	428-012P	C2GB: BOTTOM CAP	1
27	F-1019-03	LOCKWASHER, HVY, 3/8, YZ	8
28	F-1394	HHCS,3/8-16NC X 1",GR.5, YELLOW PLATED	8
29	H-1010-02	FITTING,GREASE,1/4-18NPT STRAIGHT STEEL/ ALEMITE #1627-B OR EQUIV	1
30	H-1025-01	PIPE PLUG, 1/4 HEX SOCKET HD PRESSURE PLUG	1

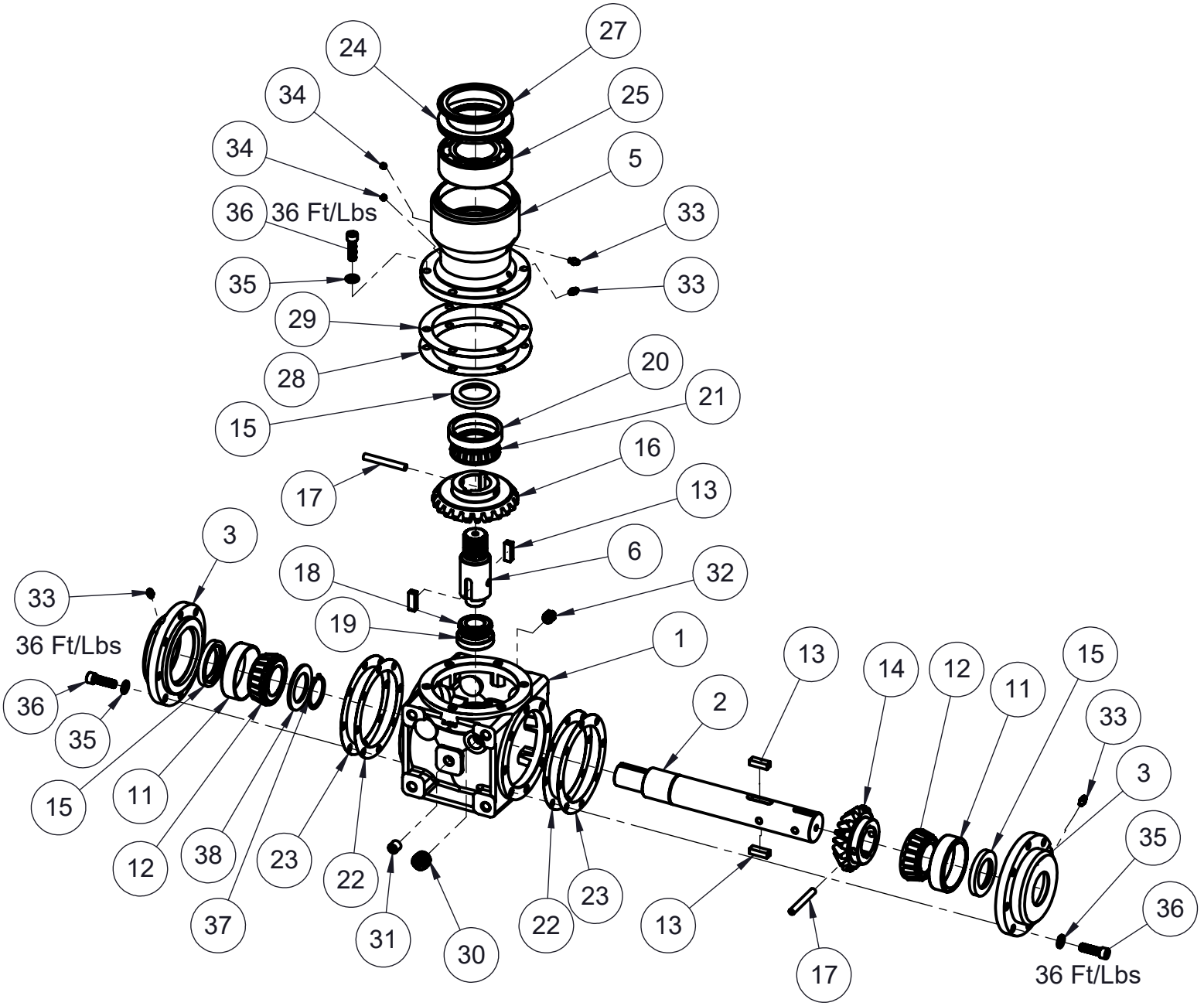
429-008A

OUTPUT SHAFT REPLACEMENT KIT

ITEM	PART NO.	DESCRIPTION	QTY
2	428-169P	DF4-2400, HTX: Top Housing w/Flanged Sleeve Bearings	1
3	428-159P	DF3-25CGB, HTX: SIDE CAP, 8-BOLT	1
5	D-2013-01	CONE-BEARING	1
6	D-2014-01	CUP-BEARING	1
7	D-4016	BRG,BALL (1-ROW): 35mmIDx72mmODx17mmW,6207LU	1
8	D-4007	Seal, Oil: 52mmIDx72mmODx8mmW	1
9	D-3028	GEAR, 17 TOOTH BEVEL	1
10	428-053P	HI-TORQUE GEAR BOX (HTGB) KEY, SQ: 5/16"" X 1-1/16""L, 8630	1
11	F-1036-29	SPIRAL SPRING HVY 1/4 X 2 HBK CARBON, HEAVY DUTY.035 THK MAT'L	1
12	D-4086	WASHER, BELLEVILLE: 1.00""IDx1.358""ODx0.0197""T	2
13	H-1056	FITTING, GREASE, 1/4-28, SELF-TAP	1
14	F-1636	LOCKWASHER 3/8, HICOLLAR, SPRING	6
15	F-1170	SHCS, 3/8-16 X 1-1/4", w/PATCH, GR8	6

BOTTOM HSG ASSEMBLY, 428-161A

DF3-25CGB (RED)



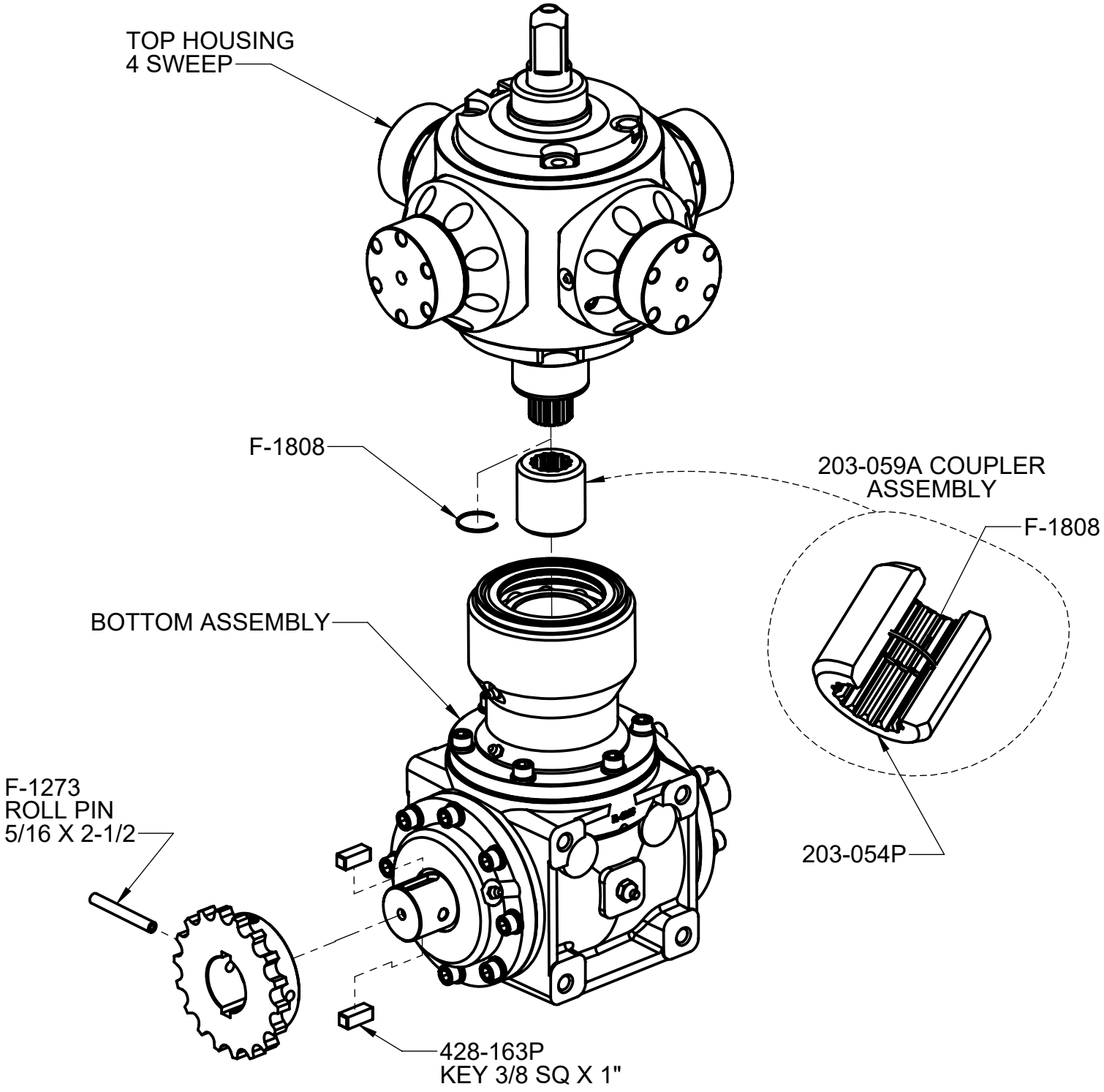
BOTTOM HSG ASSEMBLY, 428-161A

DF3-25CGB (RED)

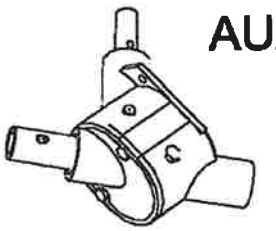
ITEM	PART NO.	DESCRIPTION	QTY
1	428-129P	C3GB: BOTTOM HOUSING	1
2	428-158P	DF3-25CGB,HTX: INPUT SHAFT (12.000""L)	1
3	428-154P	C3GB, HTX: INPUT CAP	2
4			
5	428-131P	C3GB: CENTER SECTION	1
6	428-130P	C3GB: CENTER SHAFT	1
7			
8			
9			
10			
11	D-4011	Bearing, CUP, TRB: 26823	2
12	D-4010	Bearing CONE, TRB: 26885	2
13	428-134P	KEY, 5/16 X 3/8 X 1.125	4
14	D-3927	PINION GEAR: 17TX5DPX 1.625"ID	1
15	D-3819	OIL SEAL, VITON: 1.625ID X 2.500 OD X .313 W	3
16	D-3926	BEVEL GEAR: 23TX5DPX1.625INID	1
17	F-1273	ROLL PIN, 5/16 X 2 1/2"L	2
18	D-2018-01	TRB Cone 44643	1
19	D-2019-01	TRB Cup L44610	1
20	D-3822	Cup, TRBrg: 2.891""ODx0.580""W, LM501310	1
21	D-3821	Cone, TRBrg: 1.625""IDx0.780W, LM501349	1
22	H-3113	SHIM GASKET: 5.50""ODX4.260'ID X.005'TX.375'HOLES(8)	4
23	H-3114	SHIM GASKET: 5.50""ODX4.260'IDX.015'TX.375'HOLES(8)	4
24	D-3643	VITON SEAL CR#29912 VITON SEAL, 3.00IDX4.008OD	1
25	D-3166	BEARING, DOUBLE ROW #3211W 2.615"" BORE; 3.937"" OD; 1.3125"" THK, FULL SETS DBL ROW BEARINGS	1
26			
27	428-016P	C2GB: PROTECTOR WASHER	1
28	H-2875	C3GB SHIM GASKET: 6.000""OD x 4.640""ID x 0.005""TH	3
29	H-2876	C3GB SHIM GASKET, 6.000""OD x 4.640""ID x .015""TH	3
30	H-1963	NPTF, HEX-SOCKET PLUG WITH MAGNET, 1/2-14	1
31	H-1025-01	PIPE PLUG, 1/4 HEX SOCKET HD PRESSURE PLUG	1
32	H-1010-02	FITTING,GREASE,1/4-18NPT STRAIGHT STEEL/ ALEMITE #1627-B OR EQUIV	1
33	H-1056	FITTING, GREASE, 1/4-28, SELF-TAP	4
34	F-1252	SCREW, SET SKT CP PT 1/4-28 X 1/4	2
35	F-1019-03	LOCKWASHER, HVY, 3/8, YZ	22
36	F-1170	SHCS, 3/8-16 X 1-1/4", w/PATCH, GR8	22
37	H-2688	SNAP RING, EXT. 1.625 SHAFT, IRR#3100-162	1
38	H-3128	WASHER, LOW-CARBON ST: 1-5/8""IDX2-3/8""ODX0.134t	1

429D SERIES GEARBOX

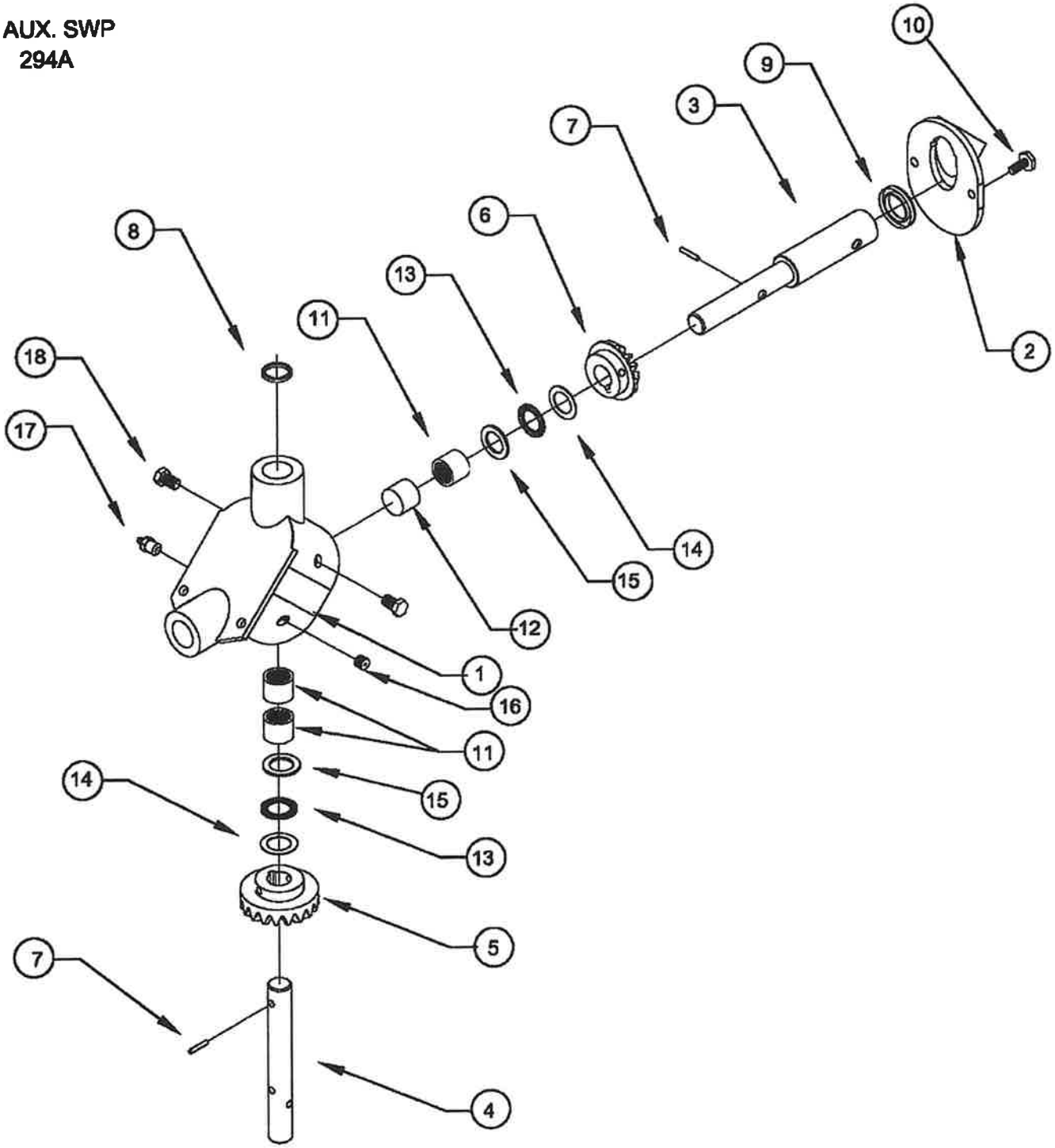
DF2500 4SWP (RED)



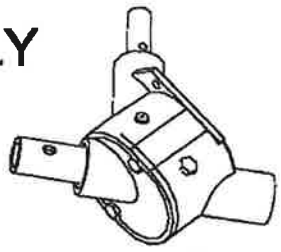
AUXILIARY SWEEP GEARBOX ASSEMBLY
294A-001A



AUX. SWP
294A



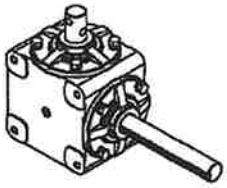
AUXILIARY SWEEP GEARBOX ASSEMBLY
294A-001A



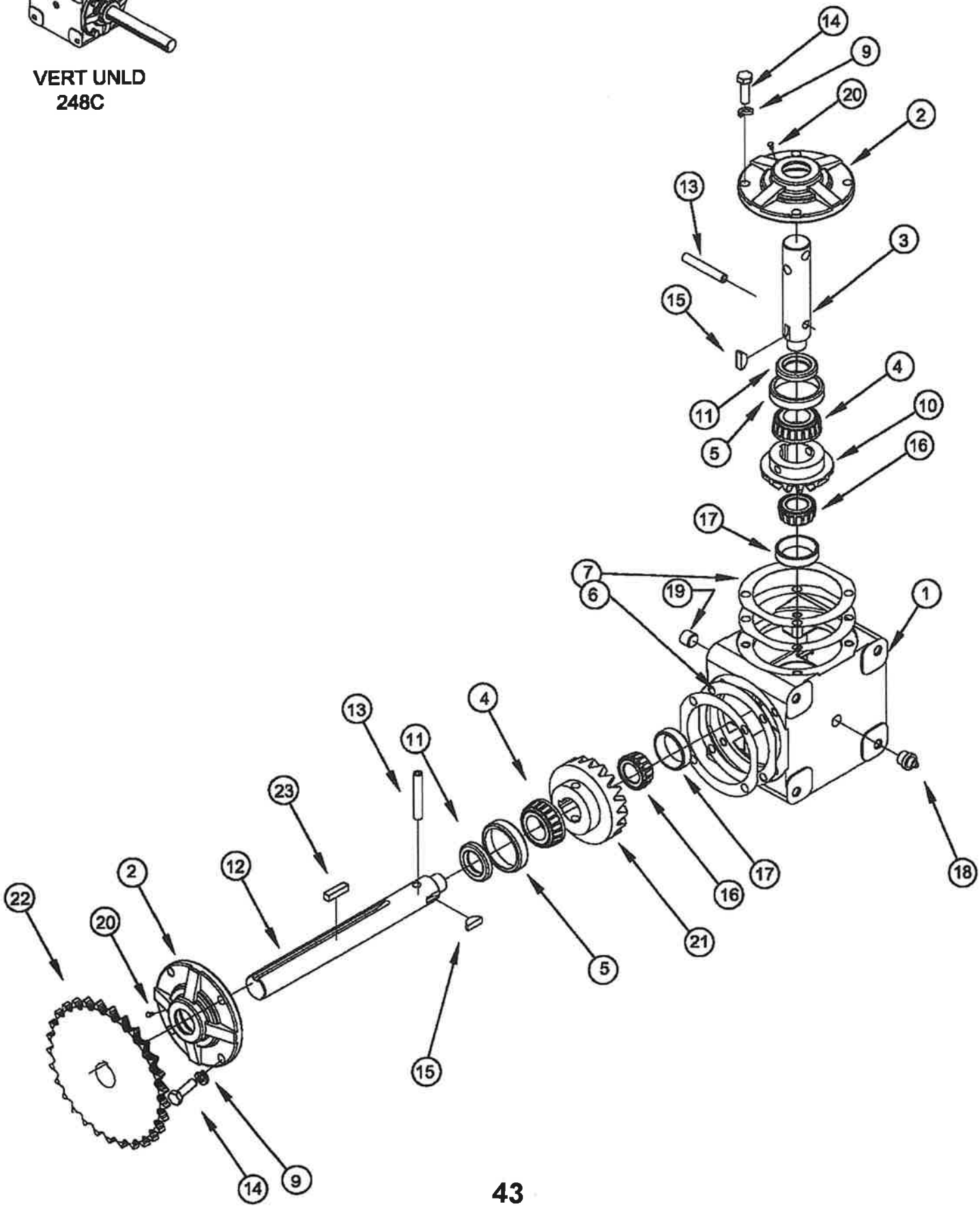
AUX. SWP
294A

Item:	Description:	Qty.	Part No.
1	Body	1	294-008P
2	Cap	1	294-009P
3	Shaft, 10.125"	1	294-004P
4	Shaft, 8"	1	294-005P
5	Gear, 19 tooth	1	294-003P
6	Gear, 14 tooth	1	D-3023
7	Roll Pin, double, 5/16 x 2"	1	F-1036-39
8	Seal, in Body, CR9815	1	D-7001-01
9	Seal, in Cap, CR14810	1	D-7001-02
10	Capscrew, HHCS 3/8 x 1"	1	F-1006-259
11	Bearing, Needle, Torrington B1616	3	D-2005-01
12	Bearing, Needle, Torrington M16161	1	D-2005-02
13	Bearing, Thrust, Torrington NTA 1625	2	D-2006-01
14	Washer, Thrust, Torrington TRA 1625	2	D-2007-01
15	Washer, Thrust, Hvy Torrington TRE 1625	2	D-2007-02
16	Pipe Plug, 1/4-18 NPT	1	H-1025-01
17	Zerk, ALE 1627-B	1	H-1010-02
18	Capscrew, HHCS 1/2 x 3/4"	2	F-1006-43

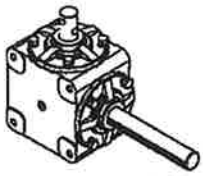
VERTICAL UNLOADER GEARBOX
248C-001A



VERT UNLD
248C



VERTICAL UNLOADER GEARBOX *
248C-001A


VERT UNLD
248C

Item:	Description:	Qty.	Part No.	
1	HOUSING	1	203-028P	
2	Cap	2	248-007P	
3	Shaft, 4.75"	1	248-008P	(To flite weldment)
4	Bearing Cone, L44643	2	D-2018-01	
5	Bearing Cup, L44610	2	D-2019-01	
6	Shim: .005"	AR	H-1066	AR= As Required
7	Shim: .015"	AR	H-1067	
9	Lockwasher, 5/16"	8	F-1019-02	
10	Gear, 14 tooth	1	D-3023	
11	Seal, CR9878	2	D-7001-07	
12	Shaft, 9.5"	1	248B-005P	(Used in both 6" and 8")
13	Roll Pin, dbl., 5/16 x 2	2	F-1036-39	
14	Capscrew, 5/16 -18 x .875	8	F-1015-14	
15	Key, Woodruff, 1/4 x 3/4"	2	D-1004-02	
16	Bearing Cone, LM11749	2	D-2016-01	
17	Bearing Cup, LM11710	2	D-2017-01	
18	Zerk, ALE 1627-B	1	H-1010-02	
19	Pipe Plug, 1/4"	1	H-1025-01	
20	Screw, #4 x 3/16"	2	F-1034-01	
21	Gear, 19 tooth	1	D-3024	
22	Sprocket, 29 tooth	1	D-3363 **	
23	Key, Square 1/4 x 1"	1	234-002P	

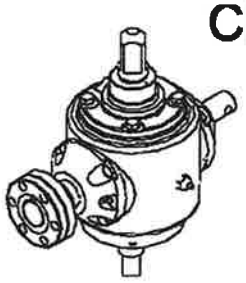
Reference---Related Assemblies

2	Cap	1	248-007P	Cap Assembly Assy: 248-010A
11	Seal, CR9878	2	D-7001-07	
5	Bearing Cup: LM67010	1	D-2019-01	
	Cap Assembly	1	248-010A	Assy: 248-012A
15	Key, Woodruff, 1/4 x 3/4"	1	D-1004-02	
4	Bearing Cone, L44643	1	D-2018-01	
21	Gear, 19 tooth	1	D-3024	
12	Shaft, 9.5"	1	248B-005P	
	Cap Assembly	1	248-010A	Assy: 248-013A
15	Key, Woodruff, 1/4 x 3/4"	1	D-1004-02	
4	Bearing Cone	1	D-2018-01	
10	Gear, 14 tooth	1	D-30234	
3	Shaft, 4.75"	1	248-008P	

**D-3007-01, 21 tooth sprocket used with gearboxes before 1985.
Sprocket is shown but not included on 248C-001A. Order separately.

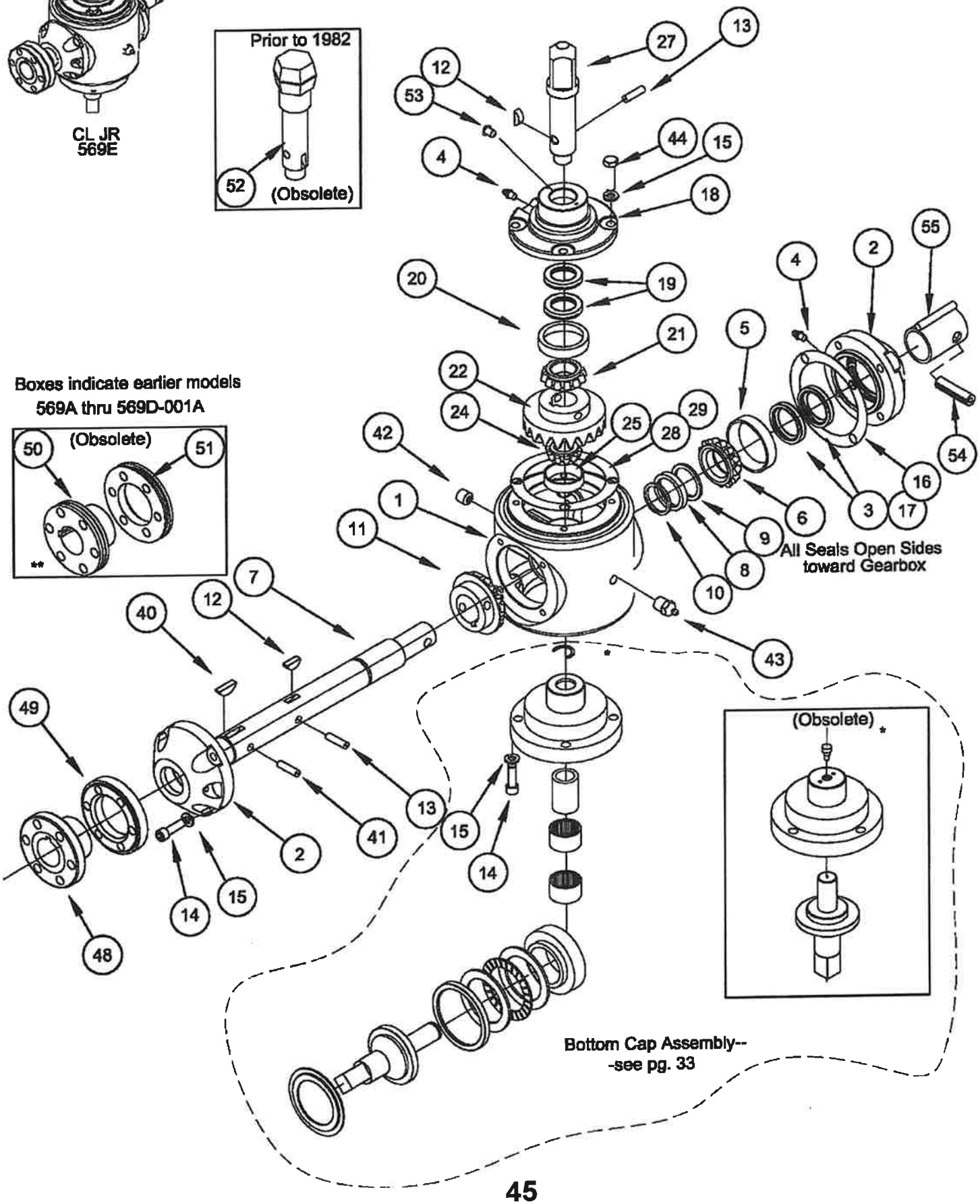
*Replaces both 248A-001A (6") and 248B-001A (8") Vertical Unloader gearboxes. When replacing one of these gearboxes, the sprocket (not included in 248C-001A) should also be replaced in the order to keep the same vertical unloader speed.

CIRCU-LATOR JR. (STIRR-A-MATIC) GEARBOX
569A-001A-569D-001A, 569E-001A (shown)

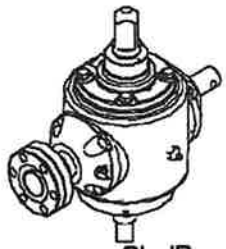


CL JR
569E

Boxes indicate earlier models
569A thru 569D-001A



CIRCU-LATOR JR. (STIRR-A-MATIC) GEARBOX
569A-001A-569D-001A AND 569E-001A (shown)



Item:	Description:	Qty.	Part No.	
1	HOUSING, TOP	1	203-012P	
2	Cap, Side	2	203-017P	Assy: 203-016A
3	Seal, 1-1/4" ID: (Nitrile) CR-12364	4	D-7001-03	(Includes Items 2-5)
4	Grease Fitting: ALE# 3038-B	4	H-1056	
5	Bearing Cup: LM67010	2	D-2014-01	
6	Bearing Cone: LM67048	2	D-2013-01	
7	Cross Shaft, 11.375	1	439-008P	
8	Collar	1	203-002P	
9	Washer	1	F-8001-01	Assy: 439-007A
10	Ring, Retainer	1	F-1033-01	(Includes Items 7,11,12 & 13)
11	Gear	1	D-3025	
12	Key, Woodruff, 1/4 x 3/4	1	D-1004-02	
13	Roll Pin, Dbl., 5/16 x 2"	1	F-1036-39	
14	Capscrews (SHCS), 5/16-18 x 1"	12	F-1048-15	
15	Lock Washer, 5/16	16	F-1019-02	
16	Shim, .005"	AR	H-1351	(Side Cap; 3.938" OD)
17	Shim, .015"	AR	H-1352	(Side Cap; 3.938" OD)
45	Bottom Cap	1	569-011P	
18	Cap, Top	1	203-014P	
19	Seal, 1" ID	2	D-7001-07	Assy: 203-034A
20	Bearing Cup, L44610	1	D-2019-01	(Includes Items 4,18-20)
21	Bearing Cone, L44643	1	D-2018-01	
22	Gear, 19 tooth	1	D-3024	
27	Shaft, Top 5.625"	1	203-015P	Assy: 203-013A
24	Bearing Cone, LM11749	1	D-2016-01	(Includes Items 12, 13, 18-24 & 52)
52	Shaft, Top, Hexagonal (Prior to 1982)		439-006P	
25	Bearing Cup, LM11710	1	D-2017-01	
28	Shim, .005"	AR	H-1066	(Top & Bottom Caps:
29	Shim, .015"	AR	H-1067	4.25" O.D.)
42	Pipe Plug, 1/4"	1	H-1025-01	
43	Grease Fitting, 1/4" NPT	1	H-1010-02	
44	HHCS, 5/16 x 1"	4	F-1110	
	Cap, Bottom Assemblies*	1	(see next page)	
48	Base	1	203Z-032P	In 569E-001A
49	Flange	1	203Z-033P	(current model)
50	Base	1	569-006P	
51	Flange	1	569-005P	(Kit 423-079-001A
40	Key, 1/4 x 1"	1	D-1004-01	includes items 40, 41, 50 & 51)
41	Roll Pin, 5/16 x 1 3/4"	1	F-1036-37	(In earlier models-prior to 1991)
53	Plug, Round Screw, #4 x 3/16	2	F-1034-01	
54	Roll Pin, 3/8 x 1 1/4"	1	F-1036-45	
55	Flipper Weldment	1	569-009W	

AR= As Required

*Note: The difference between models 569A-001A and 569D-001A are in the Bottom Cap Assemblies as indicated on the following pages.

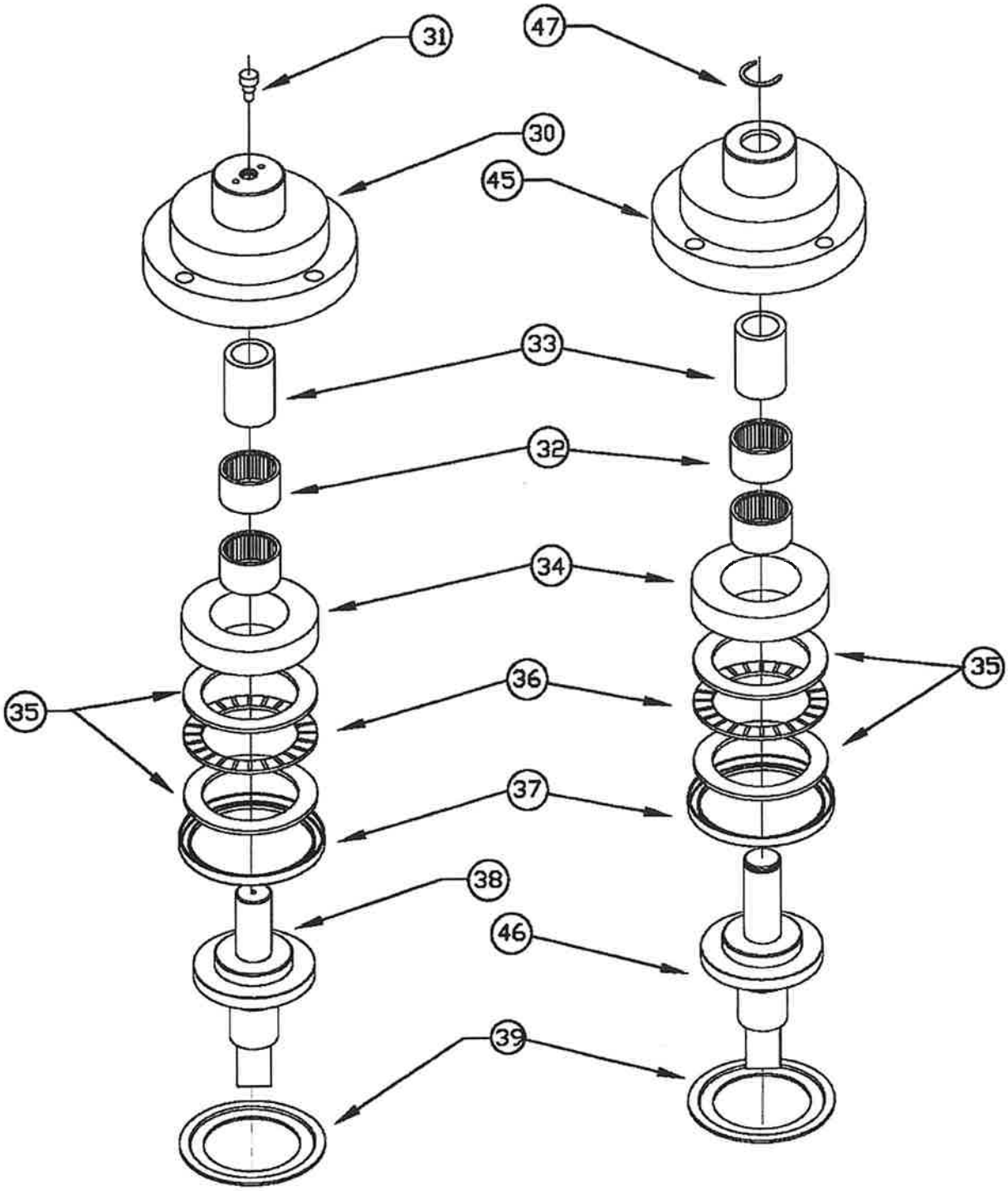
** The current model of Circu-Lator Jr. (569E-001A) has the standard base and flange.

If it becomes necessary to order parts for a Circu-Lator Jr. that are not listed here, please call Shivvers for help.

CIRCU-LATOR JR. (STIRR-A-MATIC)
BOTTOM CAP ASSEMBLIES

439-016A
USED IN 569A,B-001A
(Obsolete)

569-012A
USED IN 569C,D,E-001A



CIRCU-LATOR JR. GEARBOX
(Bottom Cap Assemblies)

For Model 569A-001A (Obsolete)

Item:	Description:	Qty.	Part No.	
30	Cap, Bottom	1	439-014P	Assembly 439-016A
31	Shoulder Screw, #10-32 x 1/4"	1	F-1178	
32	Needle Bearing, Torrington B-1612	2	D-3186	
33	Inner Race, Torrington IR-1224	1	D-3187	
34	Bearing Spacer	1	439-024P	
35	Thrust Washer, TRC 3244	2	D-3171	
36	Thrust Bearing, NTA 3244	1	D-3170	
37	Seal, CR 24863	1	D-3189	
38	Centering Plug	1	439-012P	
39	Washer, Protective	1	439-015P	

For Model 569E-001A

Item:	Description:	Qty.	Part No.	
45	Cap, Bottom	1	569-011P	Assembly 569-012A
47	Ring, Crescent, Waldes #5103-75	1	F-1581	
32	Needle Bearing, Torrington B-1612	2	D-3186	
33	Inner Race, Torrington IR-1224	1	D-3187	
34	Bearing Spacer	1	439-024P	
35	Thrust Washer, TRC 3244	2	D-3171	
36	Thrust Bearing, NTA 3244	1	D-3170	
37	Seal, CR 24863	1	D-3189	
46	Centering Plug	1	569-010P	
39	Washer, Protective	1	439-015P	

CIRC-1 GEARBOX REPAIR KIT
423-249-001A

PART#	DESCRIPTION	QTY.
D-2013-01	Bearing Cone, 1- 1/4" ID	4
D-2018-01	Bearing Cone, 1" ID	4
D-2016-01	Bearing Cone, Small	4
D-2014-01	Bearing Cup, for 1-1/4" ID	2
D-2019-01	Bearing Cup, for 1" ID	4
D-2017-01	Bearing Cup, Small	4
D-7001-03	Seal, 1-1/4" ID	4
D-7001-07	Seal, 1" ID	7
D-7001-08	Seal, Large (Center Section)	2
H-1010-04	Zerk, ¼ NPT 67°	1
H-1010-05	Zerk , ¼-28	1
H-1010-07	Zerk, ⅛ NPT	1
H-1056	Zerk, Self-Tap, ¼-28	6
H-1300	Zerk, ¼-28 45°	1
H-1351	Shim, Side Cap, .005	6
H-1352	Shim, Side Cap, .015	6
H-1066	Shim, .005	6
H-1067	Shim, .015	6
203-002P	Collar	1
D-1004-02	Key, Woodruff, 1/4 x 3/4"	7
F-1036-39	Roll Pin, Double, 5/16 x 2"	5
F-1033-01	Snap Ring	1

Center Section Bearings must be ordered separately.

Shafts, Gears, Caps, etc. must be ordered separately.

CIRC-II GEARBOX REPAIR KIT
423-250-001A

PART#	DESCRIPTION	QTY.
D-2013-01	Bearing Cone, 1-¼" ID	6
D-2016-01	Bearing Cone, Small	1
D-2012-01	Bearing Cone	3
D-2014-01	Bearing Cup, for 1-¼" ID	6
D-2017-01	Bearing Cup, Small	1
D-2011-01	Bearing Cup	3
D-7001-03	Seal, 1-¼" ID	11
D-3165	Seal, Large (Center Section)	1
H-1010-02	Zerk, Straight ¼ NPT	2
H-1056	Zerk, Self-Tap, ALE 3038-B	6
H-1300	Zerk, ¼ NPT 45°	2
H-1069	Shim, Side Cap, .005	6
H-1071	Shim, Side Cap, .015	6
H-1073	Shim, .005	6
H-1075	Shim, .015	6
203-002P	Collar	1
D-1004-02	Key, Woodruff, ¼ x ¾	7
F-1036-29	Roll Pin, Double, ¼ x 2"	7
F-1033-01	Snap Ring	1

Center Section Bearings must be ordered separately.

Shafts, Gears, Caps, etc. must be ordered separately.

CIRCU-LATOR JR. (STIRR-A-MATIC) GEARBOX REPAIR KIT
423-251-001A

PART#	DESCRIPTION	QTY.
D-2013-01	Bearing Cone, 1-¼" ID	2
D-2018-01	Bearing Cone, 1" ID	1
D-2016-01	Bearing Cone, Small	1
D-3186	Needle Bearing	2
D-3170	Thrust Bearing, Needle	1
D-3171	Thrust Bearing, Race	2
D-2014-01	Bearing Cup, for 1-¼" ID	2
D-2019-01	Bearing Cup, for 1" ID	1
D-2017-01	Bearing Cup, Small	1
D-3187	Inner Race	1
D-7001-03	Seal, 1-¼" ID	4
D-7001-07	Seal, 1" ID	2
D-3189	Seal, Large (Bottom Cap)	1
H-1010-02	Zerk, Straight ¼ NPT	1
H-1056	Zerk, Self-Tap, ALE 3038-B	5
H-1351	Shim, Side Cap, .005	6
H-1352	Shim, Side Cap, .015	6
H-1066	Shim, .005	6
H-1067	Shim, .015	6
203-002P	Collar	1
439-024P	Bearing Spacer	1
D-1004-02	Key, Woodruff, ¼ x ¾	2
F-1036-39	Roll Pin, Double, 5/16 x 2"	2
F-1033-01	Snap Ring	1

Shafts, Gears, Caps, etc. must be ordered separately.

AUXILIARY SWEEP GEARBOX REPAIR KIT
423-252-001A

PART#	DESCRIPTION	QTY.
D-7001-01	Seal, in Body, CR9815	1
D-7001-02	Seal, in Cap, CR14810	1
D-2005-01	Needle Bearing, Torrington B-1616	3
D-2005-02	Needle Bearing, Torrington M-16161	1
D-2006-01	Thrust Bearing, NTA 1625	2
D-2007-01	Washer, Thrust, TRA 1625	2
D-2007-02	Washer, Thrust, 1.552 OD	2
F-1036-39	Roll Pin, Double, 5/16 x 2"	2
F-1010-02	Zerk, Straight 1/4 NPT	1

Shafts, Gears, Caps, etc. must be ordered separately.

VERTICAL UNLOADER GEARBOX REPAIR KIT
423-253-001A

PART#	DESCRIPTION	QTY.
D-2018-01	Bearing Cone,1" ID	2
D-2016-01	Bearing Cone, Small	2
D-2019-01	Bearing Cup, for 1" ID	2
D-2017-01	Bearing Cup, Small	2
D-7001-07	Seal, 1" ID CR9878	2
H-1010-02	Zerk, ALE 1627-B	1
H-1066	Shim, .005	6
H-1067	Shim, .015	6
H-1073	Shim, .005	6
H-1075	Shim, .015	6
D-1004-02	Key, Woodruff, 1/4 x 3/4	2
F-1036-39	Roll Pin,Double 5/16 x 2"	2

Shafts, Gears, Caps, etc. must be ordered separately.

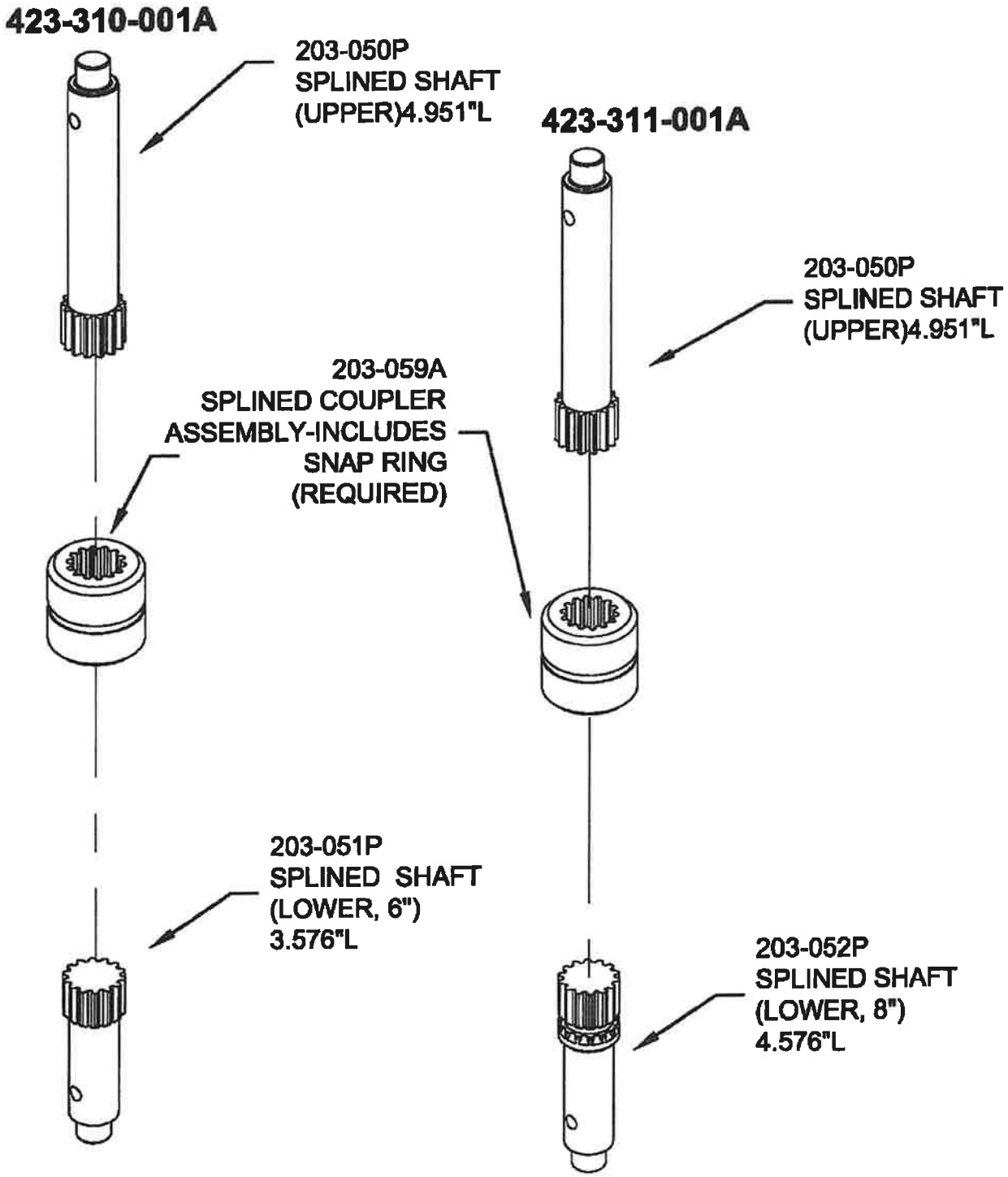
CIRC-III 428R HI-TEMP GEARBOX REPAIR KIT
423-416-001A

PART #	DESCRIPTION	QTY
D-2013-01	BEARING CONE, 1 1/4” ID	7
D-2012-01	BEARING CONE	5
D-2014-01	BEARING CUP, 1 1/4” ID	7
D-2011-01	BEARING CUP	5
D-3640	SEAL 1 ¼” ID VITON HI-TEMP	13
D-3643	SEAL, LARGE (CENTER SECTION)	1
H-1069	SHIM, SIDE CAP, .005	10
H-1071	SHIM, SIDE CAP, .015	8
H-1073	SHIM, .005	12
H-1075	SHIM, .015	8
F-8001-01	STEEL WASHER (SPECIAL)	1
H-1010-02	GREASE ZERK	2
H-1056	GREASE ZERK, SELF TAPPING	11
H-1300	GREASE ZERK	2
D-1004-02	WOODRUFF KEY, 1/4” X 3/4"	6
D-1004-01	WOODRUFF KEY 1/4" X 1”	1
428-053P	SQ. KEY 5/16” X 1 1/8”	3
428-054P	SQ. KEY 5/16” X .898”	4
656-027P	SQ. KEY 1/4" X 1 1/8”	2
F-1036-29	DOUBLE ROLL PIN 1/4" X 2”	6
F-1033-01	RETAINING RING	1
203-002P	COLLAR	1
H-2873	SHIM GASKET, 5.500"OD X 4.265"ID X .005"TH	3
H-2874	SHIM GASKET, 5.500"OD X 4.265"ID X .015"TH	3
H-2875	SHIM GASKET, 6.000"X 4.640"ID X .005"TH	3
H-2876	SHIM GASKET, 6.000"X 4.640"ID X .015"TH	3

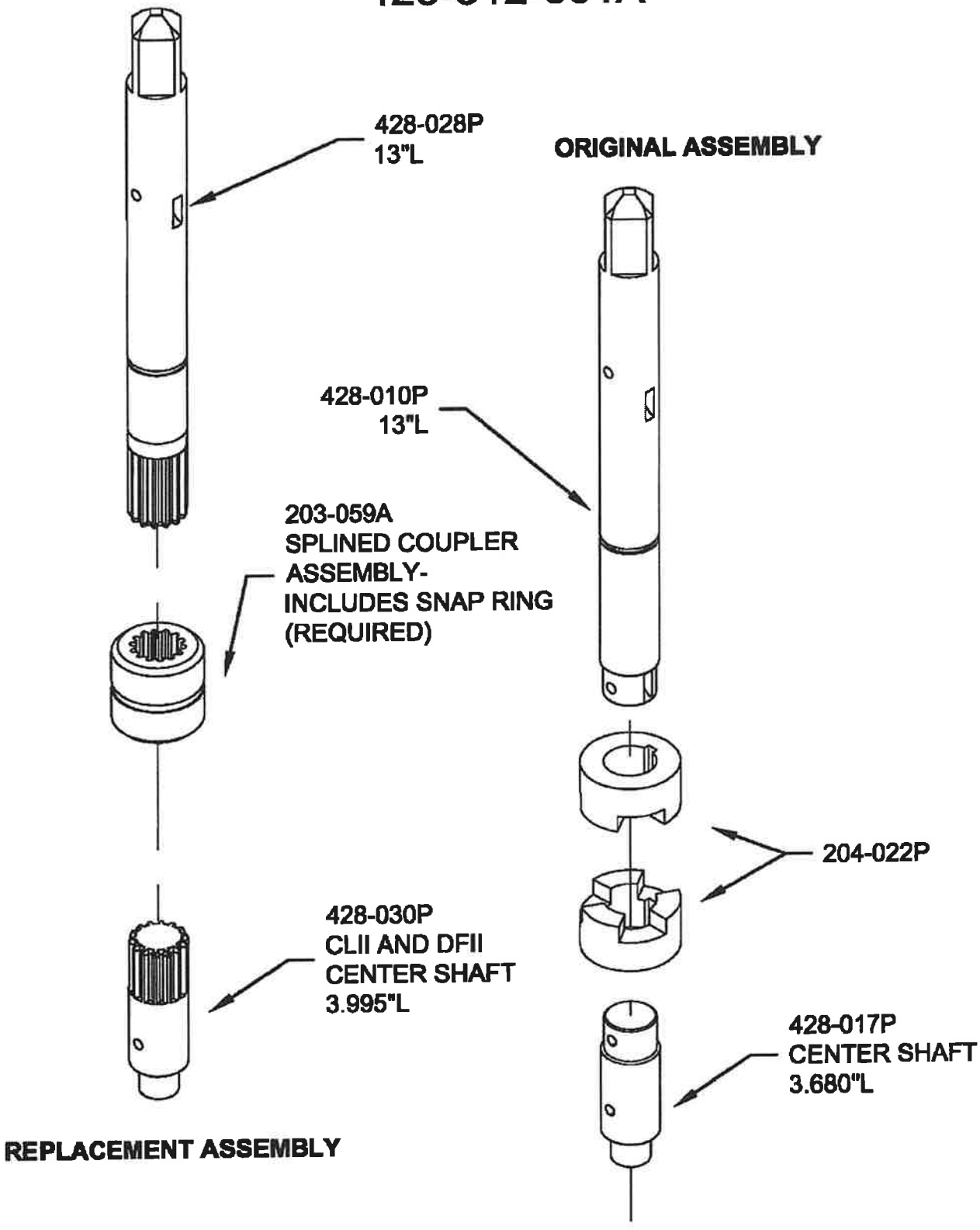
C3HT 428S GEARBOX REPAIR KIT
423-461-001A

PART#	DESCRIPTION	QTY
D-3166	BEARING, DOUBLE ROW #3211W 2.615"" BORE; 3.937"" OD; 1.3125"" THK, FULL SETS DBL ROW BEARINGS	1
D-4009	BEARING, RAD. BALL (1-Row): 62/22	3
D-4010	Bearing CONE, TRB: 26885	2
D-4011	Bearing, CUP, TRB: 26823	2
D-4013	BEARING SLEEVE (OILITE BRNZ), 1-1/4"ID X 1-1/2"OD X 1-1/4"L	1
D-4016	BRG,BALL (1-ROW): 35mmIDx72mmODx17mmW,6207LU	3
D-2013-01	CONE-BEARING	5
D-2014-01	CUP-BEARING	5
D-3821	Cone, TRBrg: 1.625"IDx0.780W, LM501349	1
D-3822	Cup, TRBrg: 2.891"ODx0.580"W, LM501310	1
H-1010-02	FITTING,GREASE,1/4-18NPT STRAIGHT STEEL	2
H-1056	FITTING, GREASE, 1/4-28, SELF-TAP	11
H-1069	GASKET	4
H-1071	GASKET	4
H-2875	C3GB SHIM GASKET: 6.000"OD x 4.640"ID x 0.005"TH	4
H-2876	C3GB SHIM GASKET, 6.000"OD x 4.640"ID x .015"TH	2
H-3114	SHIM GASKET: 5.50""ODX4.260'ID X.015'TX.375'HOLES(8)	2
428-053P	HI-TORQUE GEAR BOX (HTGB) KEY, SQ: 5/16" X 1-1/16"L, 8630	3
428-054P	HIGH TORQUE GEARBOX (HTGB) KEY, SQ: 5/16" X .898" L,8630	2
428-134P	KEY, 5/16 X 3/8 X 1.125	4
F-1033-01	RING-RETAINING	2
F-1036-29	SPIRAL SPRING HVY 1/4 X 2 HBK CARBON, HEAVY DUTY.035 THK MAT'L	3
H-2688	SNAP RING, EXT. 1.625 SHAFT, IRR#3100-162	1
D-2018-01	TRB Cup L44610	1
D-2019-01	TRB Cone 44643	1
D-3640	VITON SEAL CR#12343 1.25ID X 1.756 OD	3
D-3643	VITON SEAL CR#29912 VITON SEAL, 3.00IDX4.008OD	1
D-3819	OIL SEAL, VITON: 1.625ID X 2.500 OD X .313 W	2
D-4007	Seal, Oil: 52mmIDx72mmODx8mmW	3
D-4015	WASHER, BELLEVILLE: 22.4MMIDX34.6MMODX0.5MMT	12
H-3128	WASHER, LOW-CARBON ST: 1-5/8""IDX2-3/8""ODX0.134t	1

CLI SPLINED SHAFT KIT
423-310-001A, 423-311-001A

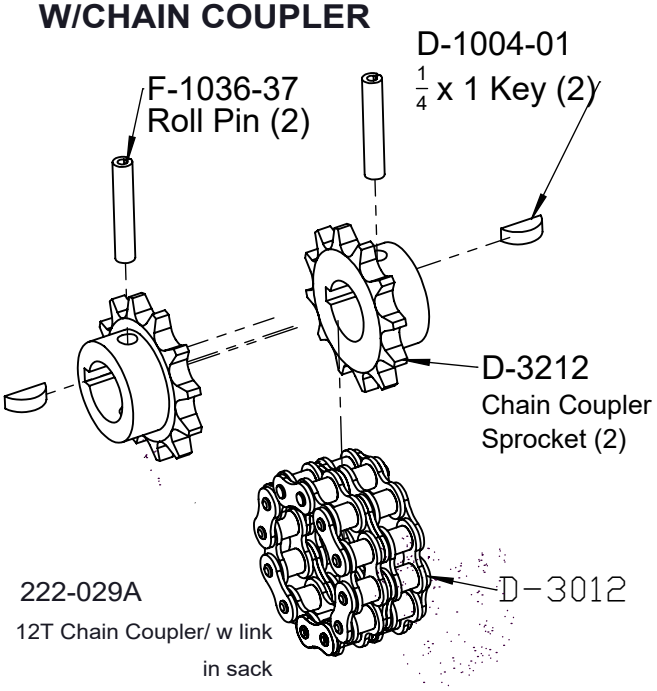


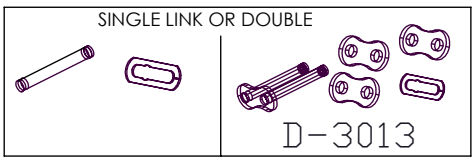
CLII GB & DF SPLINED SHAFT KIT
423-312-001A



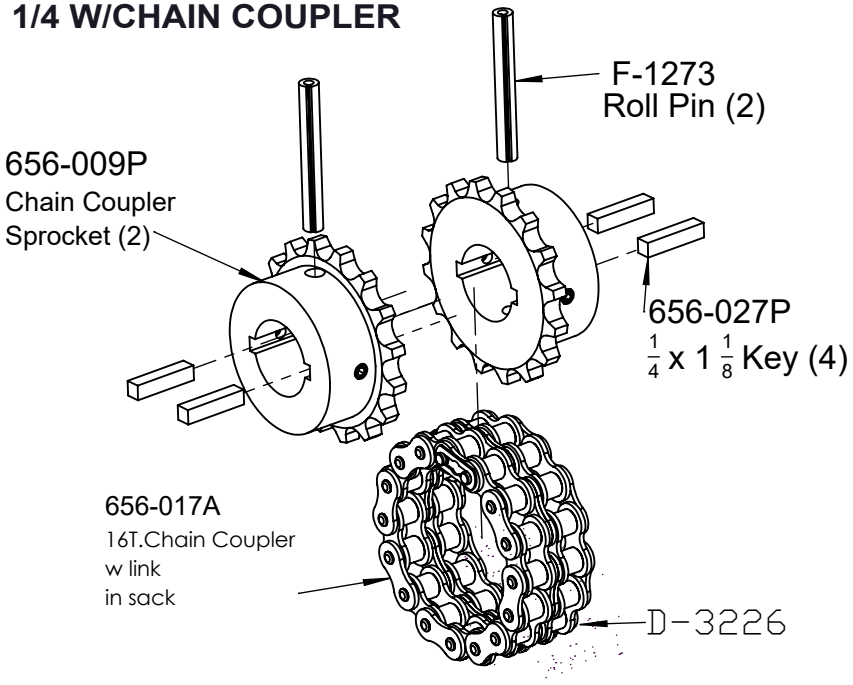
CIRCU-LATOR GEARBOX CONNECTIONS

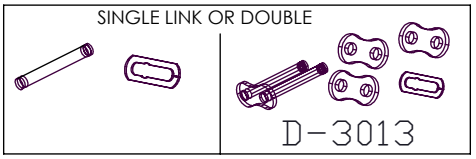
423-050-001A
CIRCU-LATOR OR DRI FLO 12T. SPROCKET KIT W/CHAIN COUPLER



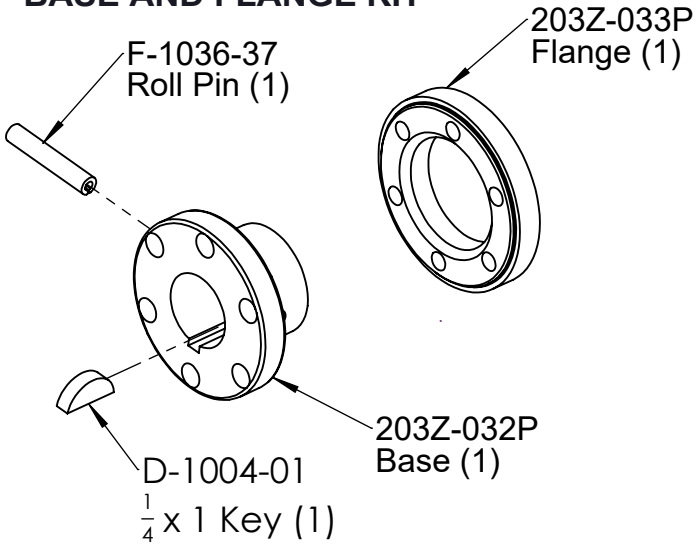


423-354-001A
CL2 HT GB KIT 16T. SPROCKET 1 1/4 TO 1 1/4 W/CHAIN COUPLER



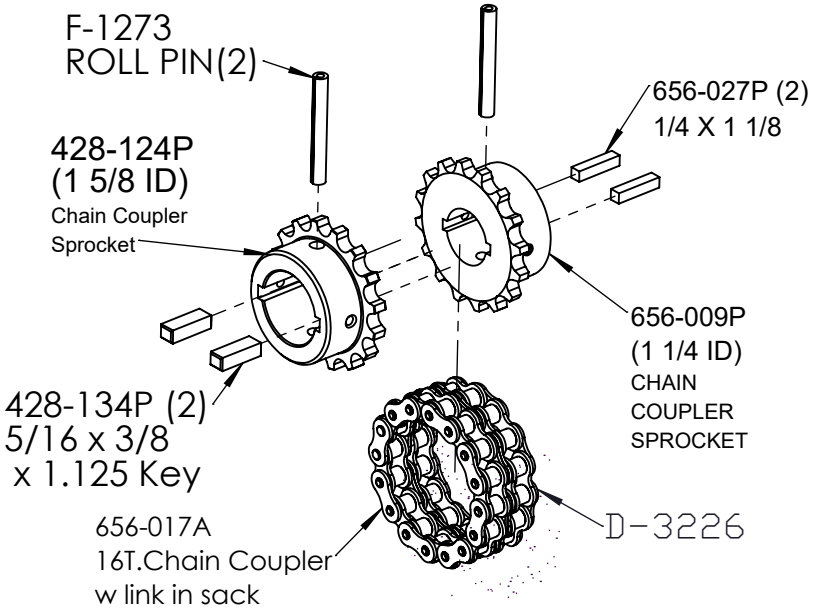


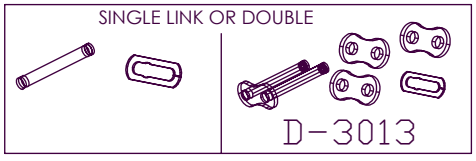
423-022-001A
CIRCU-LATOR I OR DRI FLO CIRC JR OR CIRC 2 (BEFORE 1999) BASE AND FLANGE KIT



Order kit #423-021-001A for a 1" Shaft.
(See Circu-Lator Gearbox Identification).

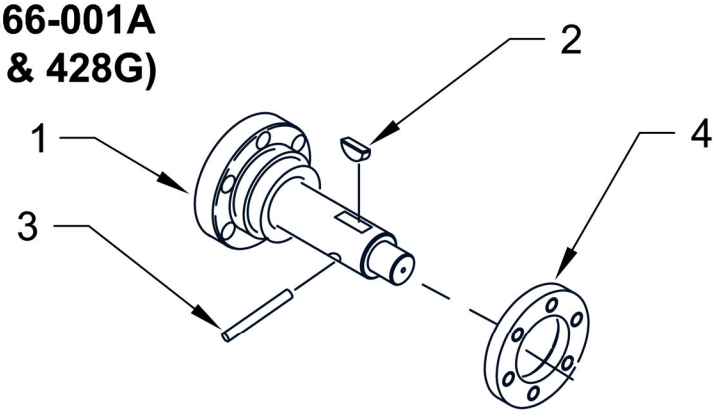
423-433-001A CL3 HT GB KIT 16T. SPROCKET 1 5/8 TO 1 1/4 ID W/CHAIN COUPLER





CIRCU-LATOR II DRI FLO GEARBOX SHAFT KIT

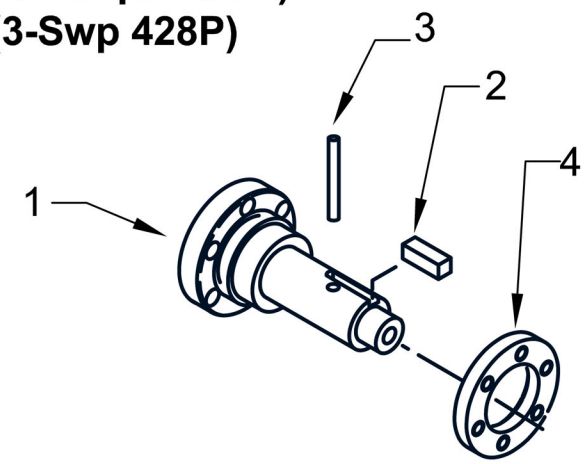
423-366-001A
(428E & 428G)



Item:	Description	Qty	Part No.
1	1 Pc. Base/Shaft	1	428-062P
2	Key, Wdf. ¼ x ¾"	1	D-1004-02
3	Roll Pin, ¼ x 2"	1	F-1036-29
4	Flange	1	208-029P

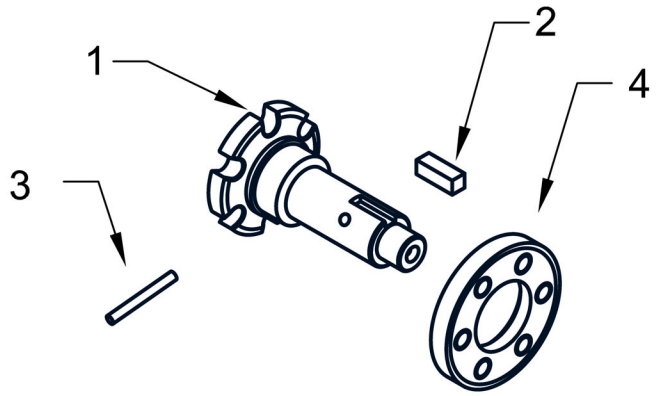
CIRCU-LATOR HI TORQUE GEARBOX SHAFT KIT

423-367-001A
(Hi-Torque 428F)
(3-Swp 428P)



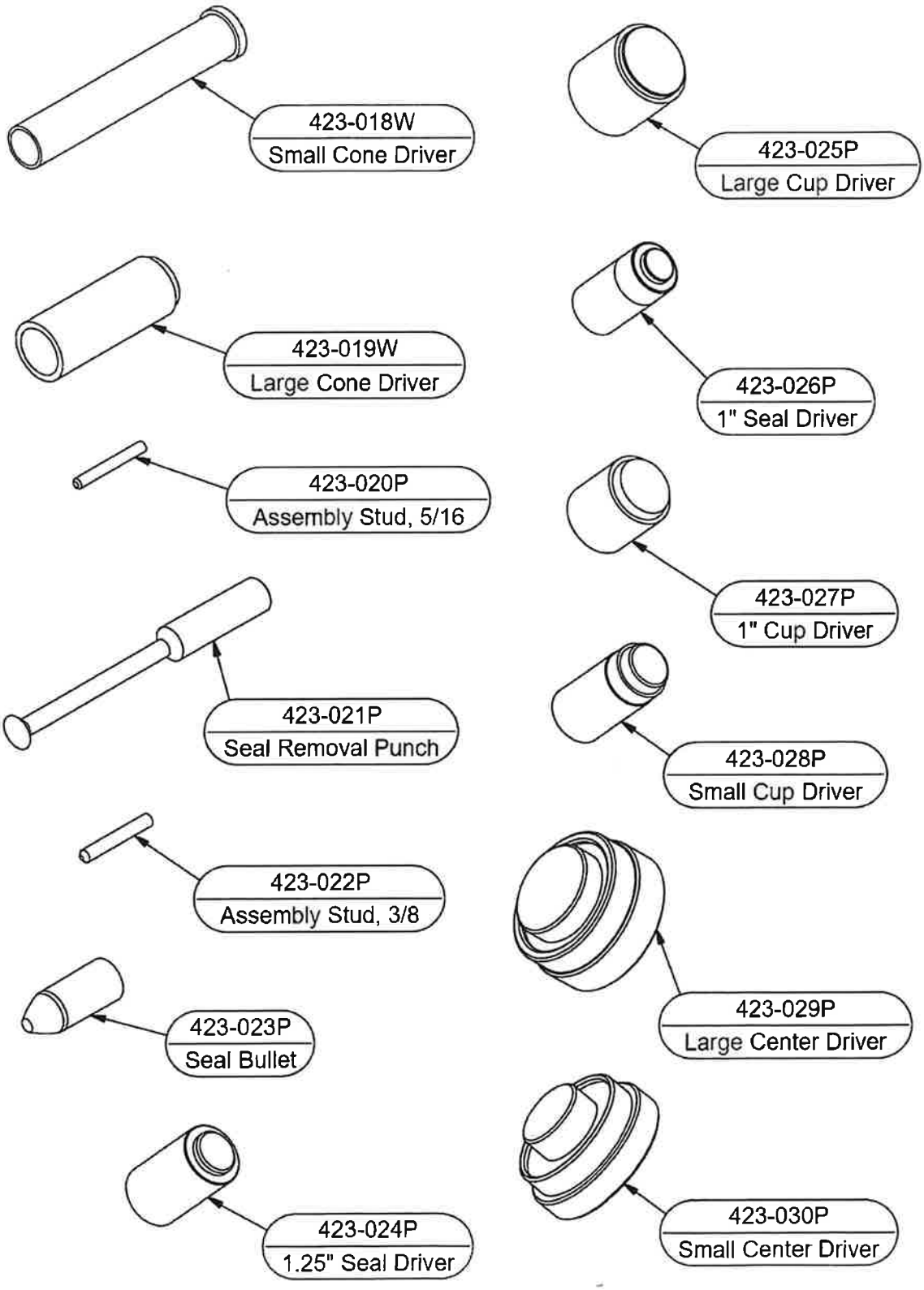
Item:	Description	Qty	Part No.
1	1 Pc. Base/Shaft	1	428-046P
2	Key, Sq. 5/16 x 1 1/8"	1	428-053P
3	Roll Pin, ¼ x 2"	1	F-1036-29
4	Flange	1	208-029P

423-414-001A
(3-Swp w/7/16-20 Bolts and Nuts)

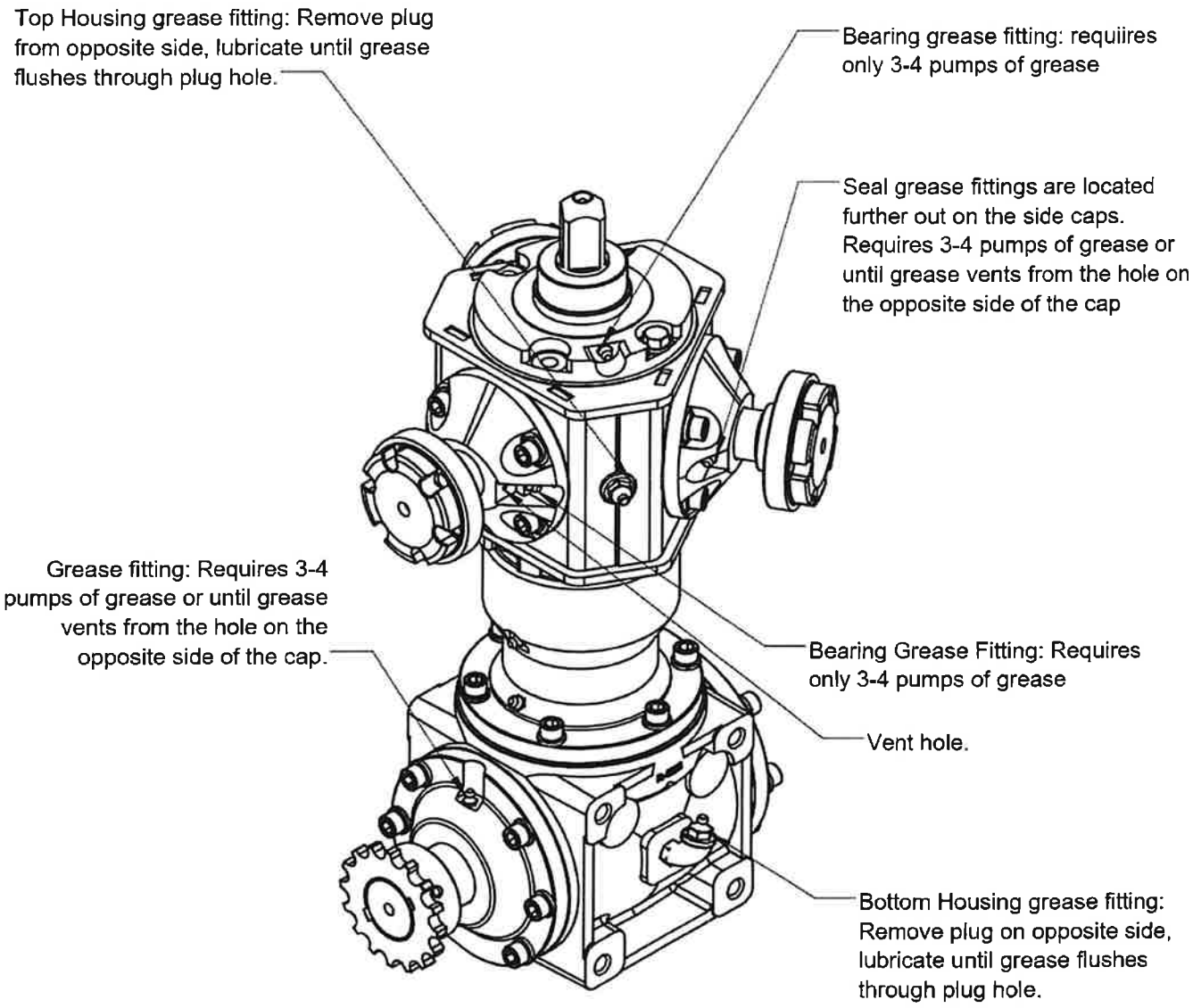


Item:	Description	Qty	Part No.
1	1 Pc. Base/Shaft	1	428-116P
2	Key, Sq. 5/16 x 1 1/8"	1	428-053P
3	Roll Pin, ¼ x 2"	1	F-1036-29
4	Flange	1	708-005P

GEARBOX TOOL REPAIR KIT
423-265-001A



GEARBOX LUBRICATION GUIDE



Use only the Specified Lubricant
Consult Parts List for your Gearbox Assembly

REPAIR INSTRUCTIONS

The following pages are provided to assist you in repairing your Gearbox. If you follow these instructions closely, you should have little problem with either Disassembly (taking it apart) or Assembly (putting it together).

Pointers and Hints to Shivvers Gearbox Repair

Remember that once a Gearbox is opened, all Warranty still in effect at that time is VOID.
Always visually inspect each part before assembling it to the Gearbox. For example:

a. Check Keyways for burrs and file off any that you find.
b. Check all used parts for wear--Gears, Shafts, Bearing Cups, etc.
c. Check Housings for cracks.

It is a good idea to "pre-pack" all Bearings with grease. Use only specified grease as listed in each section of this manual.
Be sure all Bearing Cups (races) are completely "seated"--pressed in as far as possible.
Be sure all Seals are pressed in facing in the right direction.
Oil all Seals before inserting Shafts into them.
Only use "double" roll pins of the proper length.
Only use the correct Shims. Never substitute "home made" Shims or use damaged ones. We suggest replacing the Shims with new ones.
Always check TORQUE on bolts securing caps to Gearbox.
Always check BEARING PRELOAD.
Always check BACKLASH.

Bearing Preload Adjustment

Definition of Bearing Preload: The amount of Pressure between the Bearing Cone and the Bearing Cup (race) after assembly is known as "Preload". The Preload on each Bearing is set as the corresponding Cap is bolted to the Housing.

Purpose: Proper Bearing Preload Adjustment is necessary to insure the maximum life of the Bearing and the Gearbox as a whole.

Checking the Bearing Preload: The acceptable Preload on the bearings of a particular shaft is determined by 2 steps:

a. Too Tight--more Shim is indicated. Under this condition the Shaft will not rotate easily when turned by hand.

b. Too Loose--less Shim is indicated. Under this condition side to side movement can be detected by holding the thumb and forefinger of one hand against both the Shaft and the Cap at the same time, and moving the Shaft from side to side with the other hand.

Adjustment of Bearing Preload: Proper Bearing Preload is made by adding or removing Shims (sometimes called "gaskets"). This is done by changing the number or thickness of Shims affecting either the "Driving Gear" or the "Driven Gear," or both. These Shims are located between each Cap and Housing.
In making the adjustment, you must keep in mind:

1. A minimum of at least 1 Shim is needed between every Cap and Housing. (These also serve the purpose of Sealing Gaskets.)
2. Never "Overload" the Bearings. If the Shaft cannot be turned easily with the bare hand, the bearing is too tight, and more Shim is indicated at that Cap.

3. Never Allow "Shaft Side Play". If, when all Cap bolts are tight, you can move the Shaft from side to side, less Shim is indicated at that Cap. (This movement can be detected by holding the thumb and forefinger of one hand against both the Shaft and Cap at the same time at the point where the Shaft joins the Cap, and moving the Shaft from side to side with the other hand.)

4. Always RECHECK "Bearing Preload" after adjusting, and before continuing to another procedure.

Note: If the above adjustment procedure does not work in a particular case, see the page on "Special Situations".

Backlash Adjustment

Definition of Backlash: The amount by which the width of a tooth space exceeds the thickness of engaging tooth on the pitch circles. In other words, when two gears are meshed together, the Backlash is the amount of "play" or movement before the "Driving Gear" engages the "Driven Gear".

Purpose: Proper backlash will insure longer life of the Gears as well as the associated parts (shafts, keys, pins, and bearings).

Too little backlash: (Too Tight Gear Mesh) This will result in the overloading of bearings, premature gear wear, increased power loss, overheating, and a noisy gearbox.

Too much backlash: (Too Loose Gear Mesh) This will result in uneven gear wear, and the increased possibility of gear slippage.

Measurement of Backlash: It is nearly impossible to measure accurately the amount of Backlash in an assembled Gearbox. However, a practical estimate of a proper Backlash in a Circu-Lator Gearbox can be made as follows:

A. While holding the Housing assembly with one hand, rotate each Shaft back and forth. You should feel a slight click. (The amount of rotation from one direction to the other is the backlash.)

B. Determine the approximate amount of movement of a point on the rotating Shaft. A maximum movement at this point should be about $\frac{1}{64}$ of an inch unless this causes "tight spots" between the gears as an entire revolution of the shaft is made.

Adjustment of Backlash: The adjustment to obtain the proper amount of Backlash is made by adding or removing Shims. This is done by changing the number or thickness of Shims affecting either the "Driving Gear" or the "Driven Gear", or both. These Shims are located between each Cap and Housing.

In making the adjustment, you must keep in mind:

1. A minimum of at least 1 Shim is needed between every Cap and Housing. These also serve the purpose of Sealing Gaskets.

2. Never "Overload" the Bearings. If the Shaft cannot be turned easily with the bare hand, the bearing is too tight, and more Shim is indicated at that Cap.

3. Never allow "Shaft Side Play". If, when all Cap Bolts are tight, you can move the Shaft from side to side, less Shim is indicated at that Cap. (This movement can be detected by holding the thumb and forefinger of one hand against both the Shaft and Cap at the same time at the point where the Shaft joins the cap, and moving the Shaft from side to side with the other hand).

4. Always RECHECK "Measurement of Backlash" after adjusting and before continuing to another procedure.

Note: If the above adjustment procedure does not work in a particular case, see the page on "Special Situations".

Special Situations

Due to the wearing of the parts and the compounding of manufacturing tolerances, sometimes it is necessary to use certain procedures that are not ordinarily prescribed. A few of these Special Situation PROBLEMS and SOLUTIONS are as follows:

Problem: BEARING PRELOAD cannot be properly set at the Top Cap, Bottom Cap, or End Cap. With a minimum Shim Pack (a .005" thick Shim) the Shaft is still too loose (there is still Side Shaft Play).

Solution: The Bearing Cup (race) in the center of the housing needs to be "Shimmed out". The Cup must be removed and a special Shim (203-048P-20) must be inserted under it. Then repeat the procedure for adjusting Bearing Preload.

Problem: BACKLASH or BEARING PRELOAD cannot be properly set at the Side Caps on the Cross Shaft. With a minimum Shim Pack (a .005" thick Shim) the Shaft is still too loose (there is still Side Shaft Play.)

Solution: The Bearing Cone on the Cross Shaft needs to be "Shimmed out". The Side Cap and the Bearing Cone need to be removed and a special Shim (203-048P-20) must be inserted between the Collar and the washer, before the Bearing.